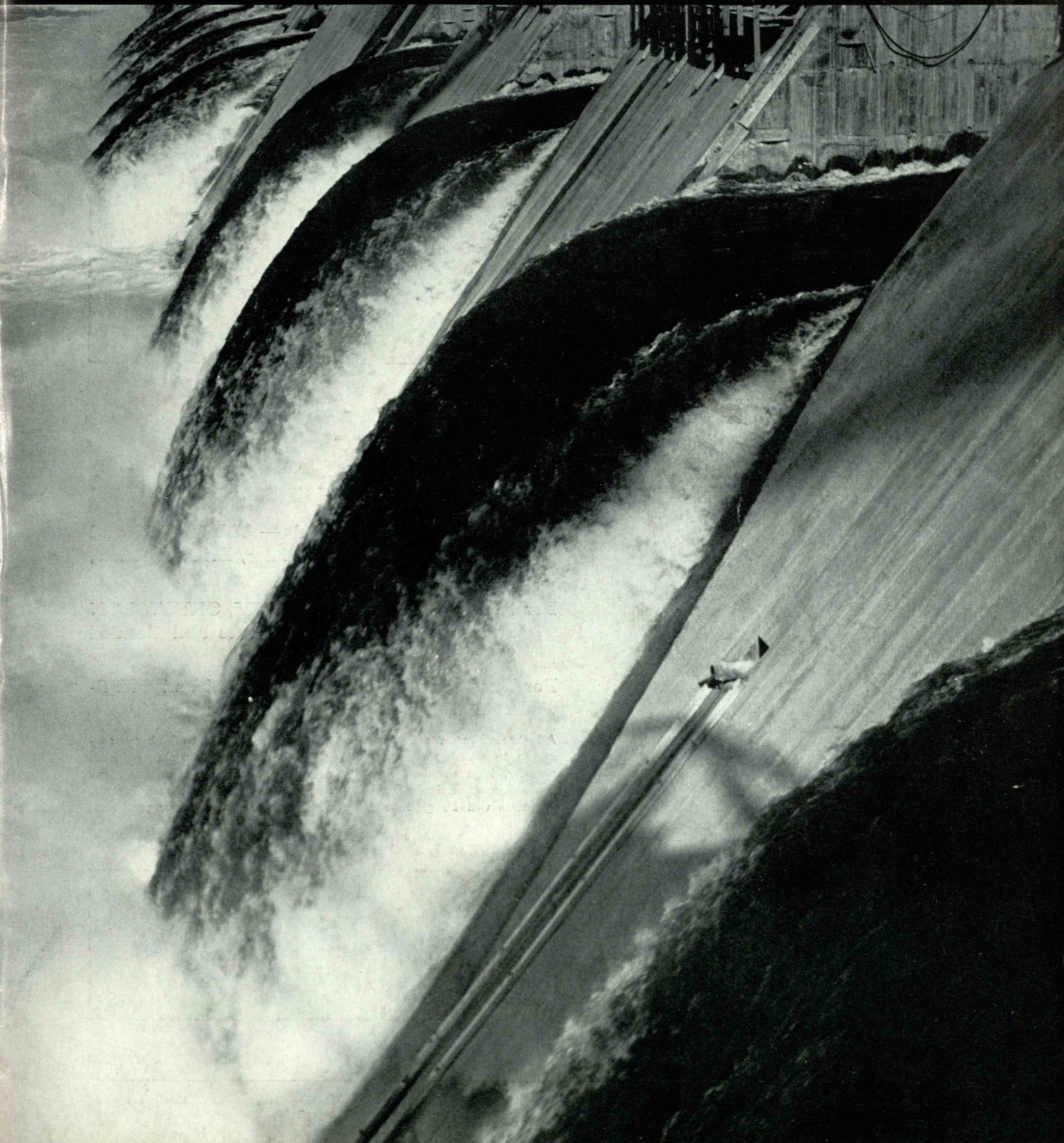


*April* 1940

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



# technology review

Published by MIT

This PDF is for your personal, non-commercial use only.  
Distribution and use of this material are governed by copyright law.  
For non-personal use, or to order multiple copies please email  
[permissions@technologyreview.com](mailto:permissions@technologyreview.com).





## For the Metal Industries . . .

### Alundum, Crystolon and Magnesia Refractories

For Heat Treating Metals—ALUNDUM and CRYSTOLON Hearth Plates, Bricks, Muffles, Tubes and Cores

For Melting Metals—ALUNDUM, CRYSTOLON and Fused Magnesia Cements and Bonded Shapes

For Enameling Metals—ALUNDUM and CRYSTOLON Muffles, Plates and Brick

**NORTON CO., WORCESTER, MASS.**

New York

Chicago

Cleveland

All three Norton refractory materials are resistant to high temperatures, to abrasion and to spalling; they have high strength, high heat transfer, high chemical stability and long life. Choice among them is dependent on individual conditions and requirements and Norton engineers will be glad to work with you in solving your problems.

# NORTON ABRASIVES

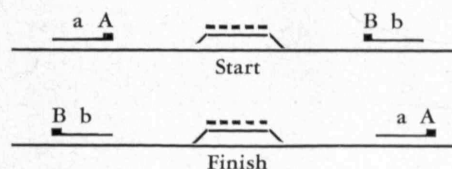
## THE TABULAR VIEW

LANGUAGE in its psychological aspects has been a matter of serious study for BENJAMIN LEE WHORF, '18, for some ten years, his concern with the science of linguistics being the outgrowth of a hobby. In this issue of *The Review* (page 229), he raises provocative questions of the ways in which our thinking may be imperceptibly influenced by the automatically accepted patterns of the grammatical system which we happen to have inherited. With the Hartford Fire Insurance Company since 1919, and special agent since 1929, Mr. Whorf investigated spoken Aztec in Mexico in 1930 under a grant from the Social Science Research Council. He has worked on the decipherment of Mayan hieroglyphs, on Aztec and Hopi grammar, and on the classification of North American Indians. He received membership in Sigma Xi in 1937 for his linguistic research and was lecturer in linguistics at Yale in 1938. ¶ Recipient, last year, of the Chemical Industry Medal awarded by the Society of Chemical Industry for valuable industrial application of chemical research, ROBERT E. WILSON, '16, discusses (page 232) recent recognition of a once wasted product as a raw material of amazing versatility now affording a rich harvest to the petroleum industry and to the chemical industry as well. Dr. Wilson's article, which is based upon his medal address, reflects the thoroughgoing knowledge which is his through varied experience with both these industries. President of the Pan American Petroleum and Transport Company, he has also been associate professor of chemical engineering at the Institute and was director and vice-president in charge of research and development for the Standard Oil Company of Indiana. ¶ To discuss dispassionately the comparative effectiveness of democratic and totalitarian states when the affairs of the world are so seriously disarranged as in our times is a delicate and difficult task. It was done to great approbation by STUART A. RICE, chairman of the United States Central Statistical Board, Bureau of the Budget, before the winter meeting of the Institute's chapter of Sigma Xi, in an address upon which is based the article by Dr. Rice in this issue (page 235). Dr. Rice earned degrees at the University of Washington and at Columbia University and has taught sociology at Dartmouth, the University of Pennsylvania, and the University of Chicago. ¶ The history of the establishment of schools of architecture in America is essentially the history of WILLIAM R. WARE (1832 to 1915). A graduate of Harvard, he came to the Institute in 1865 as its first professor of architecture, practically founding Technology's School of Architecture, the first in America; in 1881 he was called to a similar post at Columbia and again founded a great school. Hence, the discussion of architectural education which he first presented in December, 1865, and which is abridged in *The Review* (page 237) is a document of much historic note. ¶ Appropriate to the watery month of April is the photograph which comes to our cover from the United States Bureau of Reclamation — spillways at Coulee Dam.

No. 24

## Just for Fun! A CHALLENGE TO YOUR INGENUITY

IN the diagram, A and B represent engines of two 50-car trains a and b. The heavy dashes represent 50 cars with broken couplings that can be pushed but not pulled, on a siding that will hold just 52 cars and the two engines. If



neither engine can handle more than 50 cars at a time, how can the trains pass as shown? No "tricks" or "flying switches" permitted.

This problem was called to our notice several years ago by Professor A. C. Hardy of M. I. T.

We specialize in industrial physics and offer a  
"GUARANTEED RESEARCH SERVICE"

**CALIBRON PRODUCTS, INC.**  
West Orange, New Jersey



## 3 PYROMETERS IN 1

Provided with readily interchangeable thermocouples, the Cambridge Combination Pyrometer may be used for checking temperatures of still or moving rolls, mold cavities or temperatures within the mass of material. This is a sturdy, accurate and dependable instrument for shop as well as laboratory use. Single purpose pyrometers also available.

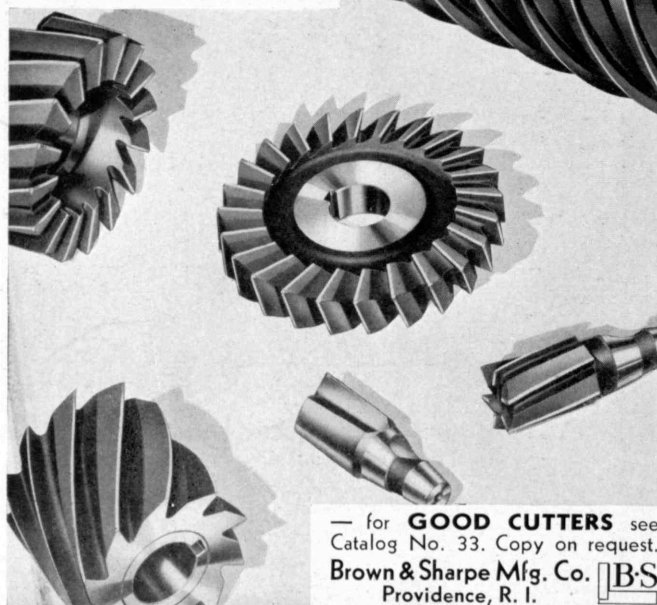
Send for descriptive literature

CAMBRIDGE INSTRUMENT COMPANY, INC.  
3732 Grand Central Terminal, New York, N. Y.

**CAMBRIDGE**  
**COMBINATION PYROMETER**



## MODERN CUTTERS for Every Job



— for **GOOD CUTTERS** see  
Catalog No. 33. Copy on request.  
**Brown & Sharpe Mfg. Co.** **BS**  
Providence, R. I.

# BROWN & SHARPE CUTTERS



Samson Trade-Mark

## Samson Cordage Works

Boston, Mass.

Herbert G. Pratt, '85, Chairman of the Board

Manufacturers of braided cords of all kinds, including sash cord, clothes line, trolley cord, signal cord, shade cord, Venetian blind cord and tape, awning line, etc., etc.

### SAMSON SPOT CORD



Reg. U. S. Pat. Off.

Our extra quality sash cord, distinguished at a glance by our trade-mark, the colored spots. Especially well known as the most durable material for hanging windows, for which use it has been specified by architects for more than forty-five years.

## MAIL RETURNS

### Goblin or Demon?

FROM ERNEST H. HUNTRESS, '20:

This fellow on the cover of the March Review appears to be traveling under an alias. The chemists all know him as Maxwell's demon, the hypothetical intelligence which Maxwell devised as a means of illustrating possible limitations on the second law of thermodynamics. The law is statistical and can therefore be evaded by the application of directive action on the elements making up a statistical group. The trigger action by which atom smashers seek to release the energy of the atom by the expenditure of an amount of energy smaller than that to be released is an example.

*M.I.T., Cambridge, Mass.*

FROM C. KING CROFTON, '22:

To clear up a great deal of speculation, will you please tell us what causes the shadowy figure on the cover of your March issue? I have read the explanation on page 177, but, although I am glad to know his name, I still am in the dark as to what causes him.

*Rochester, N. Y.*

[The shadow is cast by the base of the pilaster on each side of the doorway as it intercepts light from an elevated roadway lamp at each side of the steps.]

### Control of War Materials

FROM CLARK S. ROBINSON, '09:

In reply to Professor Dwight's question in the March Review (page 178) in regard to the peacetime storage of strategic raw materials, it will be interesting to repeat in part the following statement issued by the Army and Navy Munitions Board on January 19: "On October 11, 1939, the Army and Navy Munitions Board in an official release called attention to the possibility that abnormal exports of certain materials classified as strategic might weaken the national defense position of the United States with respect to such materials in spite of the best efforts of the government to assure an adequate supply of these commodities. . . .

"While the more patriotic and responsible dealers and manufacturers in the United States are co-operating with the Army and Navy Munitions Board in its efforts to maintain an adequate supply of these materials in the United States, others, apparently through lack of appreciation of the situation or for other reasons, are continuing to engage in export activities detrimental both to the industrial economy of the nation and to the national defense. The War and Navy departments believe that unless the method of voluntary co-operation can be counted upon to operate with complete effectiveness, it will become necessary to use other means to deal with the situation which has developed with respect to the export of crude rubber and tin."

*M.I.T., Cambridge, Mass.*

### Placing the Coolidge Dam

FROM CHARLES E. STARBIRD, '22:

Your very interesting February number shows on page 147 a fine reproduction from a photograph credited to Charles Miller. It carries the caption: ". . . This scene by the Coolidge Dam on the Gila River near Yuma. . . ." This is hardly in accordance with the facts. The Coolidge Dam . . . forms San Carlos Lake near Globe, Ariz. . . . I came out here in 1934 and, while I sometimes go back to Boston for a visit, I am sold on this wonderful "Valley of the Sun" and its marvelous climate.

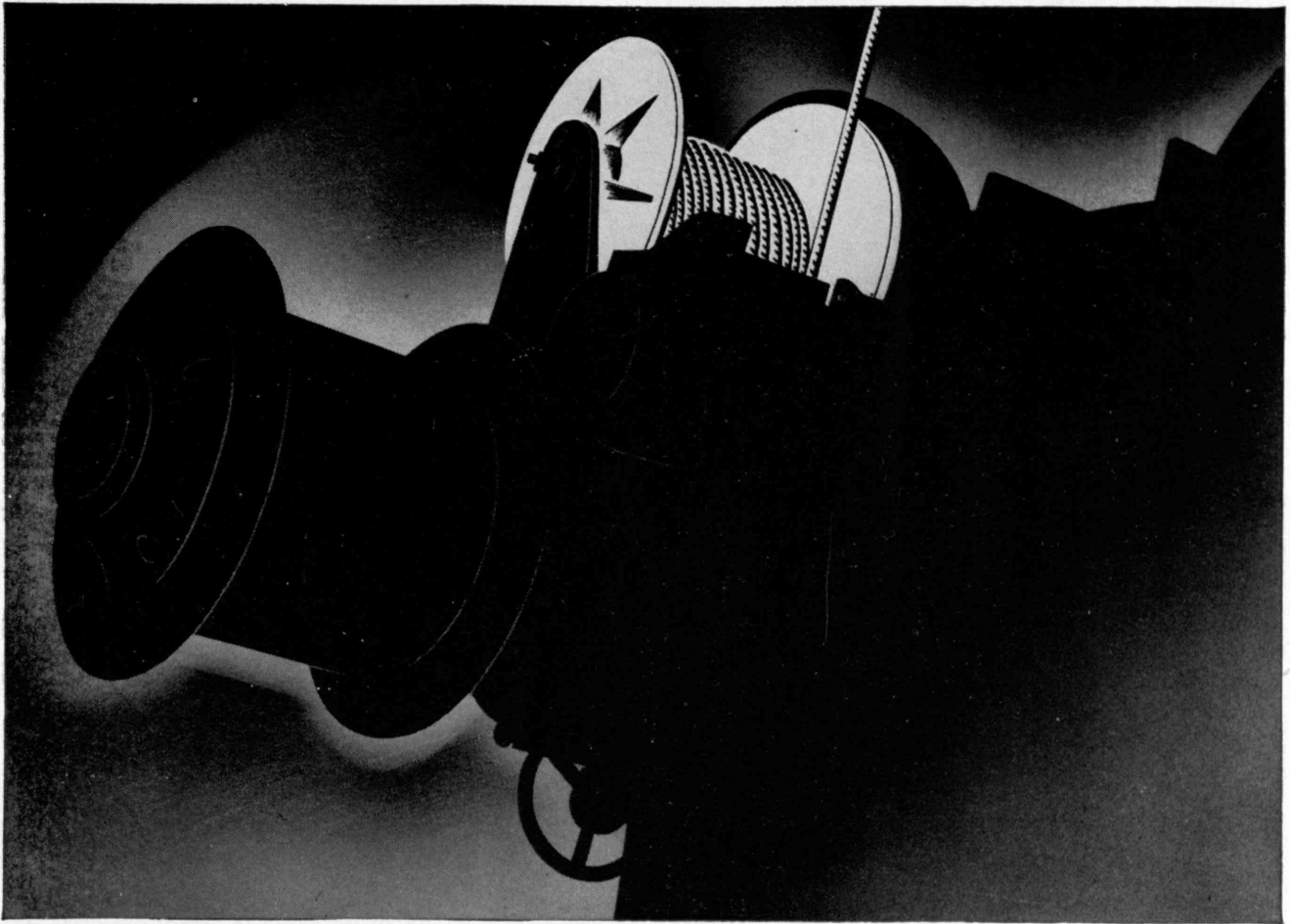
*Phoenix, Ariz.*

### Credit Where Due

FROM HENRY C. MABIE, '36:

Credit belongs only where due. Though I contributed the photograph appearing on page 149 of your February issue, I am not the photographer who took it, for which reason the credit line naming me should not have appeared.

*Jamaica Plain, Mass.*



## AGAIN A MODERN MATERIAL SAVES WEIGHT, SIMPLIFIES DESIGN

Around an oil derrick a cat line hoist that doesn't function when wanted is of mighty little use. But it is not so easy to combine the needed strength and service capacity with simplicity and lightness.

It is not easy. But it has been done—by the use of a modern material for the hoist housing, a Molybdenum (0.65% Mo.) iron. The strength and toughness of this iron safely permits light sections. And it also helps keep construction simple. The fine, close grained

structure permits the machining, in the housing itself, of surfaces sufficiently smooth to serve as outer races for the drive and drum shaft roller bearings. Premature wear or Brinelling of these races is forestalled by the hardness of the iron.

Our interesting booklets "Molybdenum in the Foundry" and "Molybdenum in Steel," containing much practical data, will be sent free on request from any interested technical student.

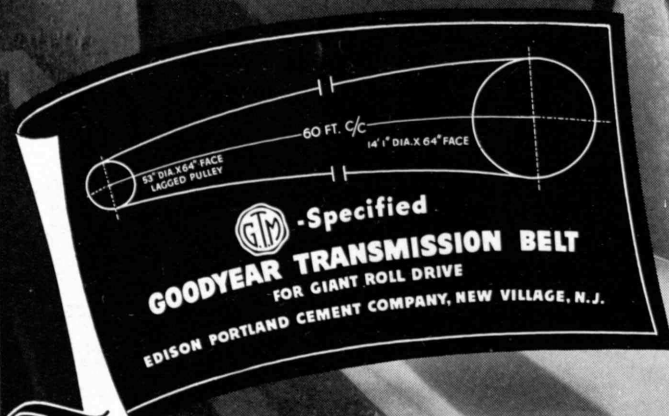
PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

**Climax Mo-lyb-den-um Company**  
**500 Fifth Avenue • New York City**



# It Makes Hash of 10-Ton Rocks

an 18-year record for the G. T. M.

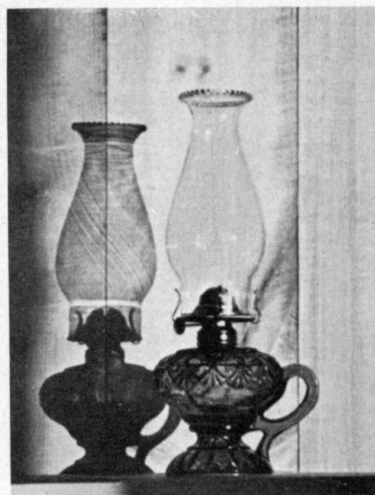


To make cement, huge limestone boulders weighing up to ten tons are ground to smithereens at the Edison Portland Cement Corporation plant at New Village, New Jersey. The impact is terrific—the strain upon the belt that drives the giant crusher tremendous! To get a belt that could take it the plant called in the G. T. M.—Goodyear Technical Man—just 18 years ago. The belt he specified, a Goodyear 9-ply rubber transmission belt is still pulling

this crushing load. Four years' service was once thought remarkable on this belt-killer, but the Goodyear belt has already beat that more than four times over! That is why it pays to consult the G. T. M.—he saves you time and expense by the correct application of rubber to your toughest problems. To bring him to your plant, write Goodyear, Akron, Ohio,

or Los Angeles, California—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER  
**GOODYEAR**



*In the shadow of  
the light*

*Eve Withers*

# THE TECHNOLOGY REVIEW

*Title Reg. U. S. Pat. Office*

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 42, NO. 6

CONTENTS

APRIL, 1940

## THE COVER

SPILLWAYS OF COULEE DAM

*From a photograph by the United States Bureau of Reclamation*

ELECTROSTATIC GENERATOR . . . . .	FRONTISPIECE	222
SCIENCE AND LINGUISTICS . . . . .	BY BENJAMIN LEE WHORF	229
<i>How Words and Customs Affect Reasoning</i>		
FROM HAZARD TO HARVEST . . . . .	BY ROBERT E. WILSON	232
<i>Oil Refinery Gases of Growing Importance</i>		
HOW EFFICIENT IS THE STATE? . . . . .	BY STUART A. RICE	235
<i>Democracy Must Reckon with the Temporary Advantage of Authoritarianism</i>		
THE TEACHING OF ARCHITECTURE . . . . .	BY WILLIAM R. WARE	237
<i>Free Trade in Ideas Is Essential to Rational Progress</i>		
THE TABULAR VIEW . . . . .		217
<i>Contributors and Contributions</i>		
MAIL RETURNS . . . . .		218
<i>Letters and Pictures from Review Readers</i>		
THE TREND OF AFFAIRS . . . . .		223
<i>News of Science and Engineering</i>		
THE INSTITUTE GAZETTE . . . . .		241
<i>Relating to the Massachusetts Institute of Technology</i>		

*Editor*

FREDERICK G. FASSETT, JR.

*Publisher*

H. E. LOBDELL

*Business Manager*

RALPH T. JOPE

*Editorial Associates*

J. E. BURCHARD · PAUL COHEN · T. L. DAVIS · J. R. KILLIAN, JR. · P. M. MORSE · J. J. ROWLANDS

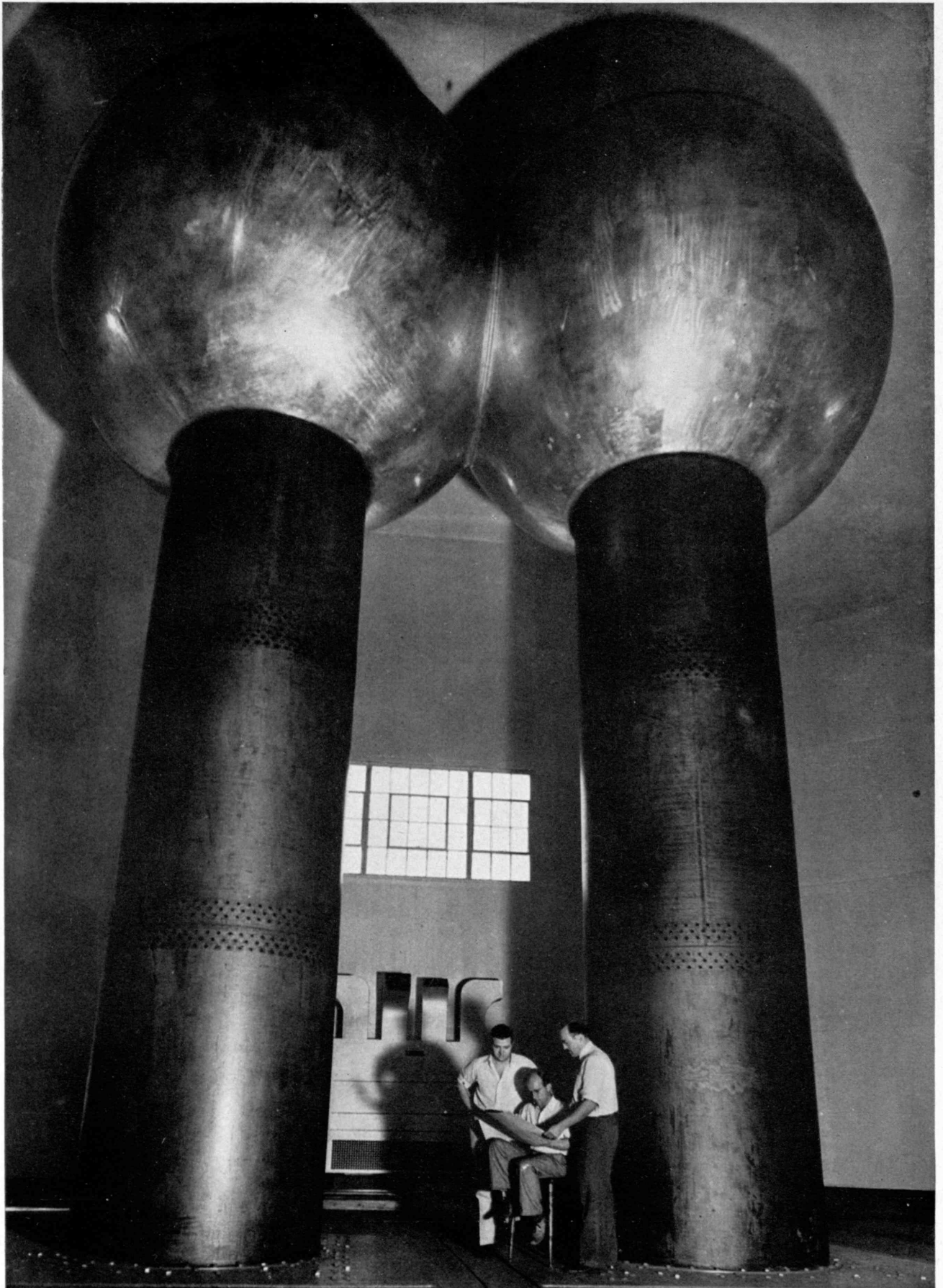
*Staff*

*Editorial: MARJORIE FULLER, JANE McMASTERS. Business: MADELINE McCORMICK, RUTH KING*

PUBLISHED MONTHLY FROM NOVEMBER TO JULY INCLUSIVE ON THE TWENTY-SEVENTH OF THE MONTH PRECEDING THE DATE OF ISSUE AT 50 CENTS A COPY. ANNUAL SUBSCRIPTION \$3.50; CANADIAN AND FOREIGN SUBSCRIPTION \$4.00. PUBLISHED FOR THE ALUMNI ASSOCIATION OF THE M.I.T. FRANK B. JEWETT, PRESIDENT; RAYMOND STEVENS, A. WARREN NORTON, VICE-PRESIDENTS; CHARLES E. LOCKE, SECRETARY; RALPH T. JOPE, TREASURER. PUBLISHED AT

THE RUMFORD PRESS, 10 FERRY STREET, CONCORD, N. H. EDITORIAL OFFICE, ROOM 3-219, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE A, MASS. ENTERED AS SECOND-CLASS MAIL MATTER AT THE POST OFFICE AT CONCORD, N. H. COPYRIGHT, 1940, BY THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. THREE WEEKS MUST BE ALLOWED TO EFFECT CHANGES OF ADDRESS. BOTH OLD AND NEW ADDRESSES SHOULD BE GIVEN.





M.I.T. Photo

# THE TECHNOLOGY REVIEW

Vol. 42, No. 6



April, 1940

## The Trend of Affairs

### *Physicists' Vices*

OUR modern physicists, who do the world's worrying about what goes on inside the atomic nucleus, usually seem wholly content in their abstractions. They have even further complicated the situation for us during recent years by denying more and more emphatically the possibility of drawing a picture of the atomic nucleus. Physicists are now becoming convinced that nothing is there but electrical forces which blend into one another and lend no sharp lines for portraiture.

But even the physicists themselves despair of having anything to put their fingers on, anything to show, as it were, for their mathematical labors. On such occasions they sit down to sketch designs and construct models which might represent the various atomic nuclei if the observable data were not strictly what they are. This activity gives them something to look at, but they hesitate to show their "doodles" — regarding it a mild heresy to draw pictures of things that are not there.

We recently attended one of the regular Harvard-M.I.T. colloquia, which was addressed by M. Stanley Livingston, Assistant Professor of Physics, who was in charge of the construction of the Institute's cyclotron. He was indulging in the secret vice, as he called it, of actually drawing pictures of the atomic

nucleus. To prepare the way for this ultramicroscopic portraiture, he gave a concise review of what is known, or believed to be known, about the properties of the nuclei of atoms.

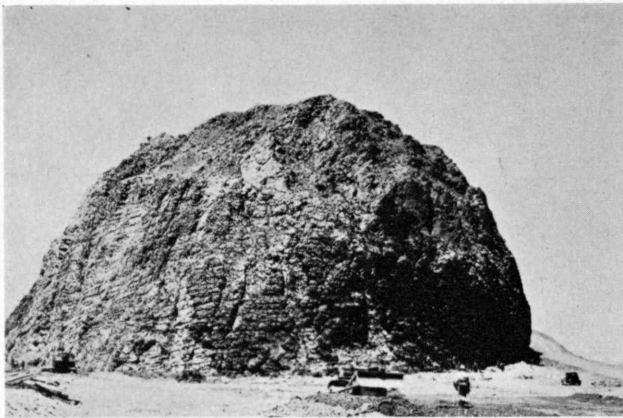
A nucleus can be assumed to be composed of two kinds of particles: protons and neutrons. They are about equal in mass, but the proton carries one unit of positive charge, whilst the neutron has none. In any stable atom, the nucleus contains as many protons as there are negatively charged electrons gyrating about it, so that a balance of charge exists. Additional weight is given by the presence of neutrons in the nucleus. Atomic nuclei may exist in all combinations of protons and neutrons, from hydrogen, which has a single proton for a mass of 1 and a charge of 1 ( ${}^1\text{H}^1$ ), to that of uranium, which has 92 protons for a charge of 92, plus 146 neutrons to bring the weight up to 238 ( ${}^{92}\text{U}^{238}$ ).

Matter in nature does not occur in all of these forms, because the characteristics of the nuclear binding forces favor certain combinations of protons and neutrons. The greatest binding forces exist between proton and neutron, being 50 per cent greater than those between two protons or between two neutrons. There appears to be exceptional stability in combinations of pairs of protons with pairs of neutrons. Thus it is easy to understand why helium, with a pair each of protons and neutrons, carbon with three pairs of each, and oxygen with four pairs of each, are such stable elements. Here an analogy may be drawn between these nuclear forces and the forces which bind whole atoms to one another to form molecules of discrete size. In a hydrogen molecule, for instance, it is a pair of one type of particle — atoms — that form a self-sufficient whole; in the nucleus, two each of two types of particles form the most stable combination.

In nature there exists an element to account for each possible charge from 1 to 92. By bombarding the nuclei of these naturally occurring elements, the physicist has added and subtracted neutrons at will, thus changing their weight without altering their electrical charge or their chemical properties. Abnormalities thus formed

◀ Looming in the adjoining frontispiece are the spheres of Technology's giant electrostatic generator, by means of which three new forms of radioactive indium have lately been created artificially by bombardment of the metal with high-voltage x-rays. Manifestations of the new activities became apparent at slightly under a million volts, and the yield mounted slightly as the voltage was increased. The group who thus confirmed findings of Notre Dame physicists and carried the advance still farther include Drs. Robert J. Van de Graaff, Lester C. Van Atta, and Chester M. Van Atta; and Doyle L. Northrup — all of the Department of Physics.





are isotopes, of which each element may possess several, and some as many as ten. Many of these isotopes have been found also in nature, the most notable being heavy hydrogen, which possesses a nucleus of a proton and a neutron.

Now to examine a nucleus in the process of being altered; hydrogen has a simple nucleus and will serve our purpose. Actually the atomic weight of hydrogen is not exactly one, but a little more; the nucleus alone weighs 1.00813 units. The neutron weighs 1.00893 units. When a neutron combines with the hydrogen nucleus to form an atom of heavy hydrogen, the ensuing weight of the nucleus is found to be .00233 of a unit less than the sum of the weights of the two original particles. The lost mass has been transformed into energy, liberated in the form of a gamma ray, leaving this new nucleus with less potential energy and therefore with less ability to disintegrate. We say that the nucleus has gained "binding energy," which is really a negative quantity. Calculations show that this binding energy is equivalent to 2,170,000 volts, which is just the amount of energy a gamma ray must possess to break up the atom of heavy hydrogen into its original constituents.

Many similar experiments in atom smashing have allowed physicists to form various pictures, mostly mental, and to draw various analogies designed to show some order in what has previously seemed a tremendous complexity of nuclear mass and energy. One analogy compares the atomic nucleus to a waterdrop, in which the molecular forces causing surface tension of the water are similar to the forces resulting in the binding energy of the nucleus. Within the outer envelope we may imagine for convenience that smaller globules exist, containing a pair each of protons and neutrons, the grouping which appears to have such unique stability. Additional neutrons may be sprinkled about in the interstices to add weight and supplementary binding.

The waterdrop analogy has particular value in suggesting the fission of the uranium atom, which has been the most startling bit of atom smashing completed during the past year. High-speed photographs have shown

*The age-old fascination of a big noise and a change in the face of the earth — 86,000 tons of rock brought down by 28,400 pounds of dynamite in a Pennsylvania quarry of the Lehigh Portland Cement Company. The twenty-seven shot holes were from 61 feet to 106 feet deep, 6 inches in diameter. The beginning of the blast was evidenced by the treelike smoke formation in the first of the three adjoining photographs.*



that a falling drop of water often vibrates back and forth from the general shape of a vertical cucumber to that of a horizontal pancake, until finally it may stretch so far in the cucumber shape that surface tension may constrict it in the middle and divide it into two separate drops. Perhaps an analogous vibration is set up within the uranium nucleus by the particles which bombard it. Being the largest and heaviest of them all, the uranium nucleus always was inclined to be ungainly — a little too obese for inner atomic comfort.

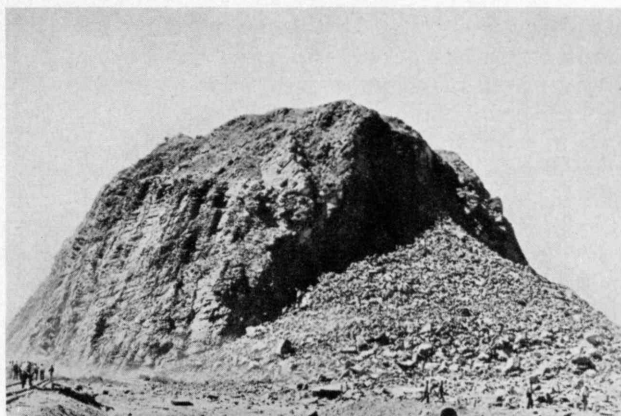
### *Thumb and Theory in the Furniture Business*

TO the casual observer of life in the Machine Age, one of the era's minor mysteries is why the making of refrigerators differs so profoundly from the making of Louis XIV bedroom sets. For the products usually identified with the Machine Age, rapid progress is practically a point of honor. In 1914, for instance, an average factory employee took 187 hours to earn the price of an electric washing machine. In 1938 a much improved apparatus cost only 62 hours of labor, a 67 per cent drop. For the automobile the cost changed from 4,514 hours to 1,098 hours in the same period.

For the furniture business, however, this drop is of the order of 35 per cent if the charge for a moderately priced bedroom set is taken as indicative. Considering the greatly improved performance of the washing machine and automobile, furniture's statistical picture seems not too bright.

*Engineering News-Record*





Atlas Powder Company

However, there are extenuating circumstances: The three commandments of the modernist are that products — furniture no more nor less than furnaces — should, *first*, be designed for maximum usefulness and comfort; *second*, take full advantage of available materials and their special properties; and, *third*, permit mass-production methods when the article must reach a mass market.

Consideration of the first credo (using the automobile as an example of a product which appears to respond vigorously to an advancing technology, and furniture as one which is not such an obvious credit to our noble period) reveals certain inherent differences in the two products. The automobile was born but recently into the hothouse atmosphere of the Machine Age. Like most complicated devices, it was at first crude and expensive. Designers and builders had few precedents; they strayed off into blind alleys, neglected sounder methods, were handicapped by inexperience and lack of data. Such difficulties were quickly overcome, however, and fundamental improvements came rapidly — the differential, the self-starter, and so on. Later, the basic design was stabilized, and changes more frequently became refinements. This history followed a familiar pattern: the creation of a new device or process; rapid development until every resource of the existing state of technology was exhausted; more moderate progress based on research into specific problems and the application of discoveries from other fields; a new burst of progress when some fundamental advance opened a new region for achievement.



Over 28,000 pounds of explosives were used by Sharp and Fellows to slice 150,000 tons of diorite from the 200-foot high Devil's Throne in New Mexico to serve as track ballast for the Santa Fe Lines.

To a lesser extent than most technical innovations — such as the transformation of coal into oil, for example — but to a far greater extent than furniture, the automobile is independent of man's bodily idiosyncrasies. There is presumably a best height for the seat of a chair, which can be arrived at with relative rapidity, but there is no biological restriction on motor efficiency.

The furniture business was already exploiting most of its possibilities when the industrial revolution hit it. It had been an industry since the Eighteenth Century, when manufacturers began selling ready-made pieces to retailers for later distribution; and it had been a craft for a tremendously longer period. The bed is at least twenty thousand years old; the chair was known to the Assyrians; the Egyptians are reported to have had tables astonishingly like ours.

In this long period the functions of the basic furniture types have not changed, although there have been minor additions, such as the radio cabinet. These functions hardly could change as long as people fold in the same places. It is no wonder that the solution of such a bafflingly simple problem as how to keep the human posterior a constant distance above the ground has not changed with the years. A reproduction of a Babylonian chair could be successfully sat in by a 1940 glamour girl. Functionalism, after all, is the essence of common sense, a quality which our ancestors possessed in much the same measure as we — although, to give the devil his due, the moderns seem to practice it more consciously and consistently in the material side of their lives.

In taking advantage of available materials, however, the furniture industry may have an alibi but no astonishing successes to offer. A possible exception is the bed-spring and mattress. Although the Egyptians had mattresses stuffed with cotton, and the hardy Vikings reclined on feather beds, sleeping in luxury is basically a Twentieth Century phenomenon, particularly when *hoi polloi* are concerned. Inspired by a buggy spring — so the story goes — a Yankee named James Liddy developed the spiral spring for mattresses, an invention which by comparison with previous advances in the instrumentalities of sleeping is, at the very least, colossal. Continuing this lightning advance (Liddy began his





work about the time Dr. Samuel Guthrie was investigating the anesthetic properties of chloroform), rubber technologists have lately developed a type of latex sponge suitable for upholstery and mattresses, described by advertisers as a sensational aid to comfort.

In the use of metals, plywoods, and synthetic materials, the furniture business only here and there shows glimmers of genius. True, in the use of metal and plywood, the ancients were first: Legend has it that a certain Procrustes indulged in the whimsical hobby of capturing passers-by, placing them on his iron bed, and pruning or stretching them to fit. But modern methods have so altered the forms and properties of metals and plywoods that they can be regarded as new materials, a classification that certainly fits the synthetic plastics. The tubular metal chairs of Marcel Breuer and Mies van der Rohe, and the plywood chairs of Ivar Aalto — classic examples of correct use of materials — could scarcely be duplicated by the craftsmen of former eras. Aalto (his shop is, or was, in Turku, Finland) molds his plies into their final shape before they are glued together, thus avoiding the internal strains that often split plywood articles bent sharply from the solid sheet. His practice is reminiscent of the method used by a large automobile manufacturer to make trunk-compartment doors from resin-impregnated wood (on an experimental basis): A sheet of material is placed in a 1,200-ton press and in four minutes becomes a smooth, curved door. Here are the elements of true mass production.

Although its products are even nearer to universal use than is the automobile, the furniture industry is not characterized by such techniques. The reasons for this

*Plastic thread-advancing reels carrying viscose rayon yarn from stage to stage in the processing portion of the continuous-sequence method of manufacture formulated by Hayden B. Kline, '24*

*Industrial Rayon Corporation*



situation are obvious. In the passenger-car field, an annual production of over two billion dollars is divided among eleven manufacturers, three of whom have 90 per cent of the market. In the furniture business, less than five hundred million dollars' worth of trade is divided among, roughly, two thousand manufacturers, and this volume is further split among far more types and styles of product than exist in the automobile business. To some extent lack of standardization is desirable. Desks, for example, should be tailored to the person and his job more often, perhaps, than is now done. On the other hand, doubtlessly the United States could exist most comfortably with only three lengths of beds or a mere half-dozen styles of kitchen tables. One can argue (from women's hats) that articles of personal use must be highly styled or (from men's) that they need not be, but it would take a mass-production technique of as yet unknown flexibility to survive the number of decorative variations found in furniture.

Yet what has the public to complain about? It is more comfortably seated and bedded than was any preceding generation. Some say that it is also more handsomely seated. This century is the first in which furniture is generally without connotations of caste. In Imperial Rome, the X chair was a symbol of position. During the Middle Ages only the wealthy and powerful could afford decorative furniture. Catherine Parr, Henry VIII's sixth wife, had to have an ordinance passed forbidding guests from absconding with the king's furnishings, though perhaps the drain on the royal supplies was an expression more of *souvenir hunters'* zeal than of the need for household equipment. In England and France in the Seventeenth Century the mere bed of a grandee became an overelaborate means of ostentation. In Oshkosh, stenographers own grand pianos.

But is this last phenomenon the result, specifically, of progress in the furniture business? Education and hot baths are likewise no longer in the luxury class, but it is not cheapening of the product which has brought them within reach of the public. Rather, the standard of living has risen far enough to make them generally available. Again, it does not follow that, if furniture is increasing in attractiveness, the furniture industry is solely responsible. As always, there are designers available who can produce outstanding pieces. Unlike an earlier day, when such pieces retired to the privacy of some wealthy patron's home, today's masterpieces are frequently seen at world's fairs, in movies, model houses, and public buildings — a free course in art appreciation. This movement is helped by liberal advice from magazines and stores. Under such pressure, manufacturers would have no choice but to become interested in art.

All in all, it does not seem possible to view the furniture business with a feeling of undisturbed satisfaction. One wonders at the absence of large-scale research. One wonders also why the industry has not borrowed more heavily from the theories and practices of those consumer-goods industries which characterize the Machine Age, particularly when the task of making products better and cheaper is today approached with confidence and even zest. In short, one wonders why the furniture business retains in substance its traditional, small-unit form with the limitations thus implied.

## Public Buildings

**O**CCASIONALLY in man's building history three major forces have acted simultaneously; when they have, as a rule, something of architectural importance has resulted. The forces are great building activity focused on relatively few building types, a strong spirit of experiment, and vigorous aesthetic controversy.

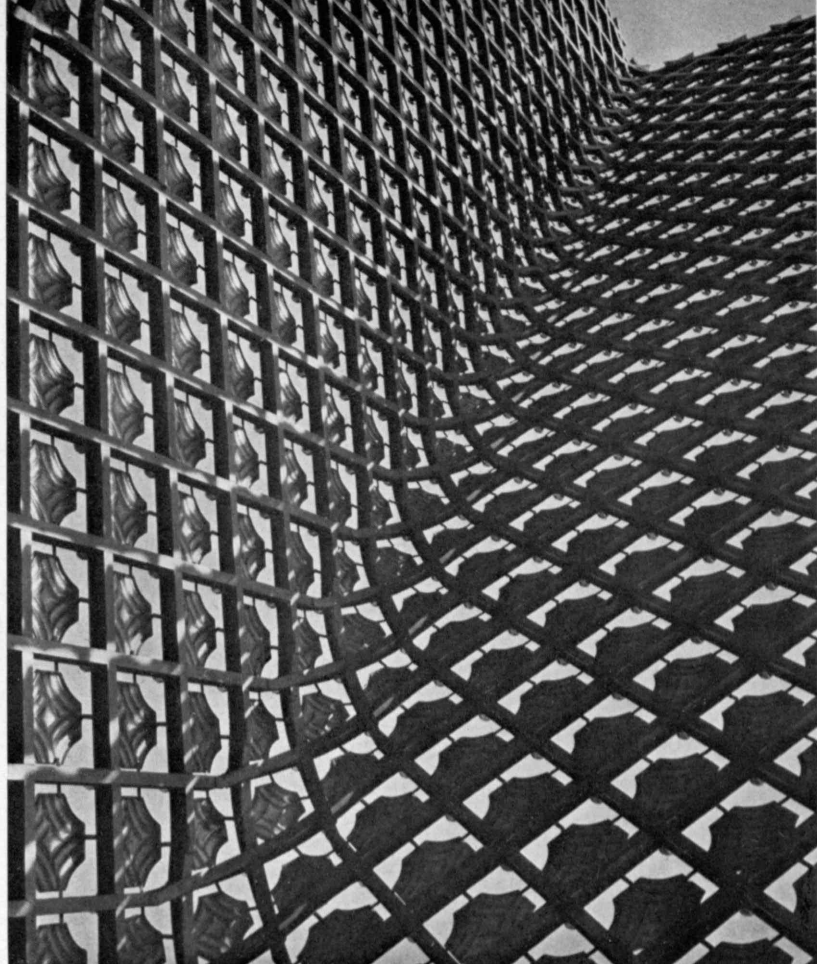
Because the United States has just passed through a period in which these three forces were, if only for a short interval, working together, it is timely that the Federal Works Agency should authorize the publication of *Public Buildings*,\* which is a survey of the architecture of projects constructed in the years 1933 to 1939 with the assistance of the Public Works Administration.

The book is 9 inches by 12 inches, running to nearly seven hundred pages, mostly pictorial. It represents a selection by its compilers from over seventeen hundred projects which were surveyed by the committee on architectural surveys, and these were drawn from over ten thousand photographs of about seventy-five hundred projects. The book evidently offers a fair demonstration of what is regarded as the best of the P.W.A. architecture by editors who have been reasonably catholic in their choice.

The text is a curious mélange of pertinent and non-pertinent facts and comment; its special articles, such as the one on schools, are scant assemblages of incomplete semitechnical material. The compilers' misunderstanding of the true principles of experimental Modern architecture is demonstrated by a definition of Modern which calls experiment "modernistic" and reveals Modern to be "the evolving style of the present time which is based on evolutions from other styles of architecture." Since no great style ever evolved in this sense, and since such a statement is the antithesis of the definition of Modern which would be made by a true modernist, it is possible to understand why, with rare exceptions, the few examples of "Modern" architecture which are sprinkled in the pages are worse than the examples of traditional architecture.

It might be gathered from the foregoing that the book constitutes a pretty grim portrayal of the state of American architecture of the moment. It does. Hence it may be well to see whether our three major forces were in fact at work this time. Unquestionably there was a spate of building activity under the P.W.A. in these years. Out of 34,500 projects, 12,600 were building projects, and these embraced 27,600 buildings. Over three thousand more buildings were constructed in association with nonbuilding projects. Not including 1938 — which was also an active year but for which no financial figures are provided — approximately one and a half billion dollars were spent on these buildings. Most of the effort was concentrated, moreover, on relatively few types: Six hundred and two millions went to education buildings, and 90 per cent of these to elementary schools; two hundred and ten millions to hospitals; a hundred and fourteen millions to housing; sixty-seven millions to administrative buildings; forty-five millions

\* Washington: Government Printing Office, 1939. xxiii, 697 pages, \$2.50.



Paul J. Woolf

*An upward look through the much talked-of tower of the Polish Pavilion at the New York World's Fair*

to community buildings; and forty-three millions to post offices. The rest was lavished on every conceivable type of building. Federal projects included 120 building types, varying from abattoirs to windmills and including such nonobvious structures as insectaria, lighthouses, rostra, sentry houses, smokehouses, and wells. Non-Federal projects included 102 types, also starting with abattoirs but ending with zoos and including bell towers, country clubs, mausoleums, sugar plants, toll houses, as well as more obvious facilities such as those for firemen, policemen, and the sanitary services of the city.

That building activity was large and fairly concentrated seems established. Of the spirit of experimentation there can be little doubt. The New Deal has not only concerned itself with such interesting social and economic experiments as those of the Tennessee Valley Authority and the Rural Resettlement Administration but, in the various W.P.A. art projects, has shown a clearly venturesome spirit. Works Progress Administration painting, P.W.A. murals, and above all the stimulating and unhappily deceased Federal theater project, all attest to this. And that we live in a period of intense aesthetic controversy is obvious.

In examining the book to determine the effect of these forces, it has not seemed reasonable to go behind the returns. Though we may happen to know of a few notable buildings created under P.W.A. support, the case must rest on the evidence displayed. From the illustrations one draws certain positive impressions: First, there is a prevailing, and not unpleasant, mediocrity to the whole business. Paul Nelson used to say that though one never had a bad meal in America, as





C. W. Ackerman

*As rebuilt in 1939, the Warren blast furnace of the Republic Steel Corporation, originally constructed in 1920 and first enlarged in 1930, became the largest in America if not in the world, its working volume being increased one-third.*

one did in France, it was also true that one never had a supreme experience at the table. That about states the case for this architecture. It is not painful to look at unless one hopes for more.

Second, indigenous qualities of architecture seem largely to have died out. In the few instances where there is an attempt at localism, it seems to be dominated not by the climate and mores of today but by a past which suggests that in Taos all buildings should look as though the Indians had built them; that in Florida it is seemly that buildings for any purpose should have Spanish Baroque entrances; and that in California it is altogether proper that firemen put on figurative monastic cowls to stalk through arcades of the early mission days. But more often throughout the country the architecture has jelled into a modified Renaissance formalism or is tied by a tenuous thread to the feeble spirit of once lively Bulfinch.

Consider, if you will, the cupola. In these pages it may be found on municipal buildings, courthouses, fire headquarters, armories, dormitories, libraries, colleges, schools, laboratories, swimming pools, sewage-treatment plants, post offices — in states from Maine to Georgia and westward to Missouri and the Northwest, with a special stop for large-scale use in Ohio.

Third, little attention seems to have been given to the purpose of a building. We might pass over such expected phenomena as the Renaissance palace which is the San Francisco Federal Office Building or the amazing result of the Oregon state capitol competition. What we might

not expect is the two-story Georgian house in Norwalk, Conn., which turns out to be a filter plant; the Cape Cod dwelling in Oregon which houses a blower system for a sewage-disposal plant; a municipal building in New Jersey which looks like the old-time estate of a Marylander; or another sewage-treatment plant in California which abounds with Spanish Martello towers and wooden balconies leading nowhere but no doubt decorating the landscape.

It might be possible not to be so angry about this sort of thing were the results confined to façades, but this same preoccupation with the pretty has, by all the evidence, given to the country for years to come a large number of fire stations and, especially, hospitals and schools which were obsolete in plan before they were built. If municipal buildings and courthouses want to be obsolete, perhaps they have the right; but to be so is unforgivable for a school.

Of course there are a few interesting and progressive buildings in this gallery. There are restorations of noble buildings such as Pierce Mill in Washington, D. C.; there are schools in Northville, Mich., and Ansonia, Conn.; a municipal swimming pool in Santa Barbara, Calif.; a storage building for a hospital in Eloise, Mich.; a sewage plant at Newport Beach, Calif.; an incinerator in Shreveport, La. Perhaps there are a few more.

But these architectural achievements are pallid in contrast to the beauty of some other P.W.A. projects which appear toward the end of the book. There is majestic sweep and grandeur or simple honest beauty in such diverse P.W.A. creations as Dam No. 5-A at Winona, Minn., Fort Peck Dam in Montana, and Boulder Dam in Arizona and Nevada; the wind tunnel at Langley Field, Va.; such bridges as Deer Island at Sedgwick, Maine, or the Triborough in New York City; the grade-elimination projects in Cincinnati and Kansas City; modern locomotives or the municipal ferryboats for New York City. It is depressing to an architect to see how thoroughly the engineer has stolen the show.

All the architects of the buildings in the book are shrouded in an annoying anonymity. To criticism of this practice, the answer has been made that designers were omitted through consideration for those whose work was not shown; that architects and engineers could not be listed lest construction contractors also want to be listed; that the P.W.A. could not even determine which architect was entitled to credit; that government publications should not advertise individuals. Though government publications may not, it appears that government buildings may, as long as those advertised are politicians.

Perhaps the most discouraging thing about this work is that it undoubtedly was liked by the taxpayers who got it. Most of the architects were selected locally, and the reasons for selection were as varied as the communities. But the book is not completely grim. In Kearney, Neb., a strange combination of open-air theater elements was contrived for which there seemed no suitable title. The ever alert designers were at no loss and have given to the language a new word, "sonatorium." In the light of this, perhaps the millions of square feet of tracing paper, the billions of bricks, the seven hundred pages of the book were not lavished in vain.



# Science and Linguistics

## *Notions about Talking and Thinking, Which Compose a System of Natural Logic, Go Wrong in Two Ways; How Words and Customs Affect Reasoning*

BY BENJAMIN LEE WHORF

EVERY normal person in the world, past infancy in years, can and does talk. By virtue of that fact, every person — civilized or uncivilized — carries through life certain naive but deeply rooted ideas about talking and its relation to thinking. Because of their firm connection with speech habits that have become unconscious and automatic, these notions tend to be rather intolerant of opposition. They are by no means entirely personal and haphazard; their basis is definitely systematic, so that we are justified in calling them a system of natural logic — a term that seems to me preferable to the term common sense, often used for the same thing.

According to natural logic, the fact that every person has talked fluently since infancy makes every man his own authority on the process by which he formulates and communicates. He has merely to consult a common substratum of logic or reason which he and everyone else are supposed to possess. Natural logic says that talking is merely an incidental process concerned strictly with communication, not with formulation of ideas. Talking, or the use of language, is supposed only to "express" what is essentially already formulated non-linguistically. Formulation is an independent process, called thought or thinking, and is supposed to be largely indifferent to the nature of particular languages. Languages have grammars, which are assumed to be merely norms of conventional and social correctness, but the use of language is supposed to be guided not so much by them as by correct, rational, or intelligent *thinking*.

Thought, in this view, does not depend on grammar but on laws of logic or reason which are supposed to be the same for all observers of the universe — to represent

a rationale in the universe that can be "found" independently by all intelligent observers, whether they speak Chinese or Choctaw. In our own culture, the formulations of mathematics and of formal logic have acquired the reputation of dealing with this order of things, i.e., with the realm and laws of pure thought. Natural logic holds that different languages are essentially parallel methods for expressing this one-and-the-same rationale of thought and, hence, differ really in but minor ways which may seem important only because they are seen at close range. It holds that mathematics, symbolic logic, philosophy, and so on, are systems contrasted with language which deal directly with this realm of thought, not that they are themselves specialized extensions of language. The attitude of natural logic is well shown in an old quip about a German grammarian who devoted his whole life to the study of the dative case. From the point of view of natural logic, the dative case and grammar in general are an extremely minor issue. A different attitude is said to have been held by the ancient Arabians: Two princes, so the story goes, quarreled over the honor of putting on the shoes of the most learned grammarian of the realm; whereupon their father, the caliph, is said to have remarked that it was the glory of his kingdom that great grammarians were honored even above kings.

The familiar saying that the exception proves the rule contains a good deal of wisdom, though from the standpoint of formal logic it became an absurdity as soon as "prove" no longer meant "put on trial." The old saw began to be profound psychology from the time it ceased to have standing in logic. What it might well suggest to us today is that if a rule has absolutely no exceptions, it is not recognized as a rule or as anything else; it is then part of the background of experience of which we tend to remain unconscious. Never having experienced anything

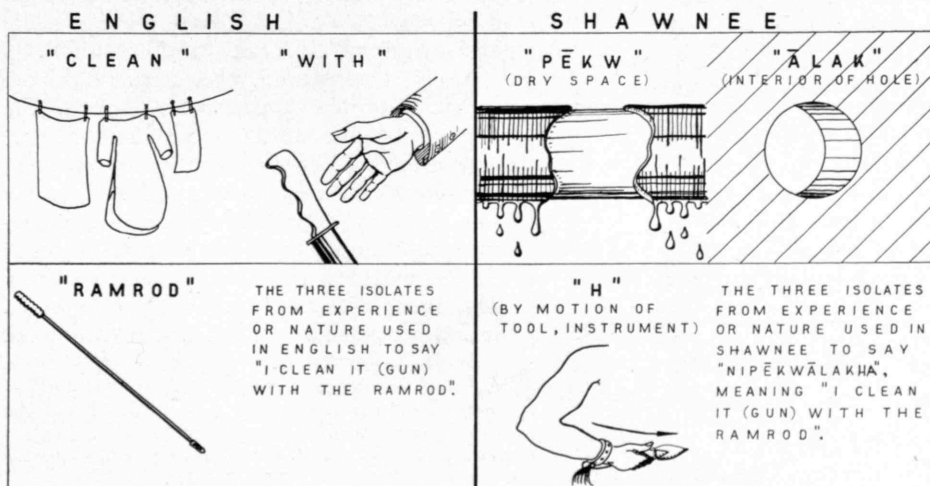


Fig. 1. Languages dissect nature differently. The different isolates of meaning (thoughts) used by English and Shawnee in reporting the same experience, that of cleaning a gun by running the ramrod through it. The pronouns "I" and "it" are not shown by symbols, as they have the same meaning in each case. In Shawnee "ni-" equals "I"; "-a" equals "it."

del. J. Martin Rosse, '40

in contrast to it, we cannot isolate it and formulate it as a rule until we so enlarge our experience and expand our base of reference that we encounter an interruption of its regularity. The situation is somewhat analogous to that of not missing the water till the well runs dry, or not realizing that we need air till we are choking.

For instance, if a race of people had the physiological defect of being able to see only the color blue, they would hardly be able to formulate the rule that they saw only blue. The term blue would convey no meaning to them, their language would lack color terms, and their words denoting their various sensations of blue would answer to, and translate, our words light, dark, white, black, and so on, not our word blue. In order to formulate the rule or norm of seeing only blue, they would need exceptional moments in which they saw other colors. The phenomenon of gravitation forms a rule without exceptions; needless to say, the untutored person is utterly unaware of any law of gravitation, for it would never enter his head to conceive of a universe in which bodies behaved otherwise than they do at the earth's surface. Like the color blue with our hypothetical race, the law of gravitation is a part of the untutored individual's background, not something he isolates from that background. The law could not be formulated until bodies that always fell were seen in terms of a wider astronomical world in which bodies moved in orbits or went this way and that.

Similarly, whenever we turn our heads, the image of the scene passes across our retinas exactly as it would if the scene turned around us. But this effect is background, and we do not recognize it; we do not see a room turn around us but are conscious only of having turned our heads in a stationary room. If we observe critically while turning the head or eyes quickly, we shall see, no motion

it is true, yet a blurring of the scene between two clear views. Normally we are quite unconscious of this continual blurring but seem to be looking about in an unblurred world. Whenever we walk past a tree or house, its image on the retina changes just as if the tree or house were turning on an axis; yet we do not see trees or houses turn as we travel about at ordinary speeds. Sometimes ill-fitting glasses will reveal queer movements in the scene as we look about, but normally we do not see the relative motion of the environment when we move; our psychic make-up is somehow adjusted to disregard whole realms of phenomena that are so all-pervasive as to be irrelevant to our daily lives and needs.

Natural logic contains two fallacies: First, it does not see that the phenomena of a language are to its own speakers largely of a background character and so are outside the critical consciousness and control of the speaker who is expounding natural logic. Hence, when anyone, as a natural logician, is talking about reason, logic, and the laws of correct thinking, he is apt to be simply marching in step with purely grammatical facts that have somewhat of a background character in his own language or family of languages but are by no means universal in all languages and in no sense a common substratum of reason. Second, natural logic confuses agreement about subject matter, attained through use of language, with knowledge of the linguistic process by which agreement is attained, i.e., with the province of the despised (and to its notion superfluous) grammarian. Two fluent speakers, of English let us say, quickly reach a point of assent about the subject matter of their speech; they agree about what their language refers to. One of them, A, can give directions that will be carried out by the other, B, to A's complete satisfaction. Because they thus understand each other so perfectly,

A and B, as natural logicians, suppose they must of course know how it is all done. They think, e.g., that it is simply a matter of choosing words to express thoughts. If you ask A to explain how he got B's agreement so readily, he will simply repeat to you, with more or less elaboration or abbreviation, what he said to B. He has no notion of the process involved. The amazingly complex system of linguistic patterns and classifications which A and B must have in common before they can adjust to each other at all, is all background to A and B.

These background phenomena are the province of the grammarian—or of the linguist, to give him his more modern name as a scientist. The word linguist in common, and especially newspaper, parlance means something entirely different, namely, a person who can quickly attain agreement about subject matter with different people speaking a number of different languages. Such a person is better termed a polyglot or a multilingual.

*Fig. 2. Languages classify items of experience differently. The class corresponding to one word and one thought in language A may be regarded by language B as two or more classes corresponding to two or more words and thoughts.*



del. J. Martin Rosse, '40

Scientific linguists have long understood that ability to speak a language fluently does not necessarily confer a linguistic knowledge of it, i.e., understanding of its background phenomena and its systematic processes and structure, any more than ability to play a good game of billiards confers or requires any knowledge of the laws of mechanics that operate upon the billiard table.

The situation here is not unlike that in any other field of science. All real scientists have their eyes primarily on background phenomena that cut very little ice, as such, in our daily lives; and yet their studies have a way of bringing out a close relation between these unsuspected realms of fact and such decidedly foreground activities as transporting goods, preparing food, treating the sick, or growing potatoes, which in time may become very much modified simply because of pure scientific investigation in no way concerned with these brute matters themselves. Linguistics is in quite similar case; the background phenomena with which it deals are involved in all our foreground activities of talking and of reaching agreement, in all reasoning and arguing of cases, in all law, arbitration, conciliation, contracts, treaties, public opinion, weighing of scientific theories, formulation of scientific results. Whenever agreement or assent is arrived at in human affairs, and whether or not mathematics or other specialized symbolisms are made part of the procedure, *this agreement is reached by linguistic processes, or else it is not reached.*

As we have seen, an overt knowledge of the linguistic processes by which agreement is attained is not necessary to reaching some sort of agreement, but it is certainly no bar thereto; the more complicated and difficult the matter, the more such knowledge is a distinct aid, till the point may be reached — I suspect the modern world has about arrived at it — when the knowledge becomes not only an aid but a necessity. The situation may be likened to that of navigation. Every boat that sails is in the lap of planetary forces; yet a boy can pilot his small craft around a harbor without benefit of geography, astronomy, mathematics, or international politics. To the captain of an ocean liner, however, some knowledge of all these subjects is essential.

When linguists became able to examine critically and scientifically a large number of languages of widely different patterns, their base of reference was expanded; they experienced an interruption of phenomena hitherto held universal, and a whole new order of significances came into their ken. It was found that the background linguistic system (in other words, the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade. Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar and differs, from

OBJECTIVE FIELD	SPEAKER (SENDER)	HEARER (RECEIVER)	HANDLING OF TOPIC RUNNING OF THIRD PERSON
SITUATION 1a.			ENGLISH... "HE IS RUNNING". HOPI... "WARI" (RUNNING, STATEMENT OF FACT.)
SITUATION 1b.			ENGLISH... "HE RAN". HOPI... "WARI" (RUNNING, STATEMENT OF FACT.)
OBJECTIVE FIELD BLANK DEVOID OF RUNNING			ENGLISH HE IS RUNNING HOPI... "WARI" (RUNNING, STATEMENT OF FACT.)
SITUATION 2.			ENGLISH HE IS RUNNING HOPI... "WARI" (RUNNING, STATEMENT OF FACT.)
SITUATION 3.			ENGLISH... "HE RAN". HOPI... "ERA WARI" (RUNNING, STATEMENT OF FACT FROM MEMORY)
OBJECTIVE FIELD BLANK			ENGLISH... "HE WILL RUN". HOPI... "WARIKNI" (RUNNING, STATEMENT OF EXPECTATION.)
SITUATION 4.			ENGLISH... "HE WILL RUN". HOPI... "WARIKNI" (RUNNING, STATEMENT OF EXPECTATION.)
OBJECTIVE FIELD BLANK			ENGLISH... "HE RUNS" (E.G. ON THE TRACK TEAM.) HOPI... "WARIKNGWE" (RUNNING, STATEMENT OF LAW.)
OBJECTIVE FIELD BLANK			ENGLISH... "HE RUNS" (E.G. ON THE TRACK TEAM.) HOPI... "WARIKNGWE" (RUNNING, STATEMENT OF LAW.)

del. J. Martin Rosse, '40

Fig. 3. Contrast between a "temporal" language (English) and a "timeless" language (Hopi). What are to English differences of time are to Hopi differences in the kind of validity.

slightly to greatly, as between different grammars. We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds — and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way — an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, *but its terms are absolutely obligatory*; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees.

This fact is very significant for modern science, for it means that no individual is free to describe nature with absolute impartiality but is constrained to certain modes of interpretation even while he thinks himself most free. The person most nearly free in such respects would be a linguist familiar with very many widely different linguistic systems. As yet no linguist even is in any such position. We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar, or can in some way be calibrated.

This rather startling conclusion is not so apparent if we compare only our modern European languages, with perhaps Latin and Greek (*Continued on page 247*)



# From Hazard to Harvest

## *Oil Refinery Gases a Raw Material of Growing Importance to Chemical and Petroleum Industries; Versatility of the Vapors Widely Exploited*

BY ROBERT E. WILSON

**T**HOUGH any industry needs cheap raw materials as a foundation for success, this requirement is especially true of the organic chemical industry, in which the number of steps in most syntheses is large and the yields are frequently low. From this point of view, oil refinery gases are as fundamentally important to aliphatic chemistry as coal tar is to aromatic chemistry. Nonetheless, refinery gases lay neglected for many years after the chemistry of coal tar and its derivatives was thoroughly developed. Not until the World War, when the production of refinery gas began to be increased by the widespread adoption of cracking, did refineries begin to recover their gas, and even this recovery was done mainly to eliminate a hazard. Often the gas was simply burned in a torch at a remote part of the refinery.

Soon, however, the more progressive refiners began to establish absorption plants to recover the equivalent of casing-head gasoline from these gases, and there was an increasing tendency to burn the gas as fuel under refinery stills. Even then, little information was available concerning the analyses of these gases. The awakening to their chemical possibilities began about 1921, with the Carbide and Carbon Chemicals Corporation, the Standard Oil Development Company, and Arthur D. Little, Inc., as the outstanding pioneers in the chemical field. The Universal Oil Products Company, the M. W. Kellogg Company, the Standard Oil companies of New Jersey and Indiana, and the Phillips, Shell, and Anglo-Iranian oil companies have been leaders in the development of other uses for refinery gases.

Refinery gases, which are primarily hydrocarbons with one to four carbon atoms, come from two principal sources: Roughly 30 per cent of the total is essentially natural gas dissolved in the crude oil and driven off in the process of distillation. This gas contains only the saturated hydrocarbons. The amount of such gas per barrel of crude varies considerably, depending upon the way the crude has been handled between the producing field and the pipe line, but modern methods have tended to increase it. The percentage of the heavier hydrocarbons in this dissolved gas is progressively greater than in most natural gas, because the higher the molecular weight of the hydrocarbon, the greater its solubility in petroleum. Since the heavier hydrocarbons are more in demand as raw materials, this refinery gas is more valuable than is ordinary natural gas, which consists largely of methane.

Much the larger part of refinery gas is that produced as a by-product of cracking operations, for the process of breaking up large molecules into smaller ones suitable for gasoline, like most crushing operations, results in the production of a certain amount of fines, or molecules too small to go into gasoline. The gas produced in cracking differs from the dissolved gas in containing generally from 12 per cent to 25 per cent of olefins (from 20 per cent to 40 per cent on a methane-free basis). Because of their great reactivity, these olefins are particularly useful as chemical raw materials. Furthermore, it is frequently possible to secure special cuts of cracked gas low in methane and high in the higher hydrocarbons.

The composition of cracked gases varies considerably, depending upon the conditions of cracking. Though it is impossible to secure accurate figures for the average composition of refinery gas, the adjacent table represents a fairly typical analysis for gas from high-pressure coil cracking.

Since more than half of this country's present gasoline is made by the cracking of heavier oils, and much of even the straight-run naphtha is being "reformed" (by a special type of cracking operation) to improve its octane number, the production of cracked gas has been increasing even more rapidly than has the use of gasoline. Gas from cracking amounts today to 7 or 8 per cent by weight of the total crude run in this country. This percentage equals about nine hundred and forty million cubic feet a day, or fourteen million tons a year. The supply

HYDROCARBONS IN TYPICAL CRACKED GAS									
WITH BOILING POINTS AND APPROXIMATE PERCENTAGES									
SATURATED					UNSATURATED				
76.8 %					18.7 %				
C <sub>1</sub> 36.0 %	METHANE	CH <sub>4</sub>		-259 °F 36.0 %					
C <sub>2</sub> 21.5 %	ETHANE	C <sub>2</sub> H <sub>6</sub>		-127 °F 15.7 %	ETHENE	C <sub>2</sub> H <sub>4</sub>		-155 °F 5.8 %	
C <sub>3</sub> 29.8 %	PROPANE	C <sub>3</sub> H <sub>8</sub>		-44 °F 19.3 %	PROPENE	C <sub>3</sub> H <sub>6</sub>		-54 °F 10.5 %	
C <sub>4</sub> 8.2 %	N-BUTANE	C <sub>4</sub> H <sub>10</sub>		31 °F 4.3 %	BUTENE-1	C <sub>4</sub> H <sub>8</sub>		23 °F 1.4 %	
					BUTENE-2	C <sub>4</sub> H <sub>8</sub>		34 °F 0.2 %	
	ISOBUTANE	C <sub>4</sub> H <sub>10</sub>		14 °F 1.5 %	ISOBUTENE	C <sub>4</sub> H <sub>8</sub>		20 °F 0.8 %	

Fig. 1

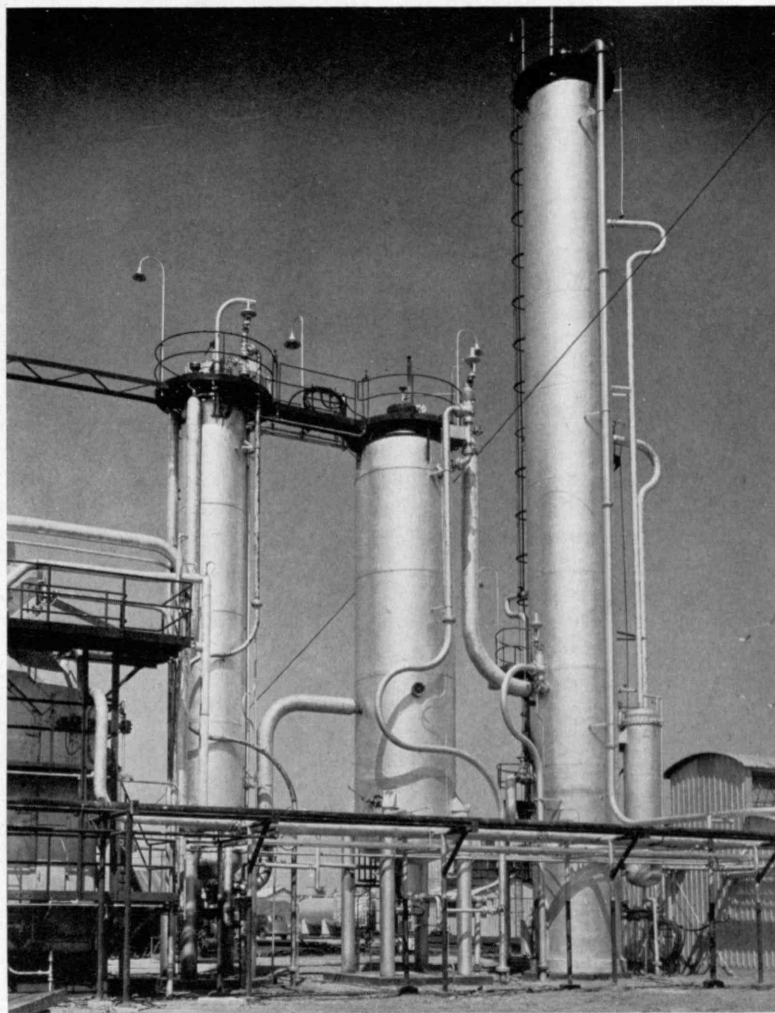
of this raw material thus appears almost inexhaustible in comparison with the scale on which the organic chemical industry operates.

Uses of the constituents of refinery gas fall into three categories: (1) direct utilization of compounds separated out of refinery gas; (2) refinery gases as raw materials for the chemical industry; and (3) the conversion of refinery gases into motor fuel and other products primarily useful within the petroleum industry.

Though a substantial percentage of butanes and butenes is almost always present in refinery gas, in an up-to-date refinery about three-fourths of the total  $C_4$  hydrocarbons and about 80 per cent of the normal butane are put into gasoline. While the  $C_4$  hydrocarbons boil in the range of 14 degrees to 39 degrees Fahrenheit, they are quite soluble in gasoline, and average gasoline contains about 9 per cent thereof. Since the butanes and butylenes are desirable from both the volatility and antiknock standpoints, it is good refining practice to put into gasoline as much as possible without running the risk of trouble from too high vapor pressure, which is likely to cause vapor lock in the gasoline feed system of cars and trucks, especially in hot weather. Gasoline in hot weather should usually not contain over 7 per cent of butanes, whereas in cold weather the presence of as much as 12 per cent is not only possible but desirable.

Since a refinery produces the butanes at a fairly uniform rate, however, only by separating out and storing the excess during the summer is it possible to secure enough to make the best winter gasoline without buying casing-head gasoline. The storage of these light ends during the summer is possible either by keeping them under pressure in spherical tanks or in what is known as refrigerated storage. In the latter the liquid, containing considerable pentane, is maintained at its boiling point (around 40 degrees Fahrenheit) in large insulated tanks, the temperature being kept down by the steady boiling off of butane vapors which are liquefied and returned to the tank to maintain the self-refrigerating cycle.

The utilization of more butane in gasoline is being facilitated by better fractionation to eliminate all propane, and by the better design of the fuel systems of cars and trucks to minimize the danger of vapor lock and permit the use of more volatile gasoline. A frequently overlooked objection to the use of alcohol in gasoline is that alcohol tends to increase the vapor pressure of gasoline very substantially and thus to reduce the amount of butane which can be incorporated. Since butanes are far cheaper and better than alcohol as a constituent of gasoline, the addition of small amounts of alcohol, which has little net effect on the quantity, actually hurts the quality of gasoline which can be produced, though it greatly increases its cost. A liquefied



*Petroleum World*

*Silvery geometry against the Montana sky is this section of the cracking unit of a new refinery at Cut Bank.*

butane cut is also used to some extent, particularly in the oil-producing states, as a motor fuel, and it is advantageous for use in refrigerated trucks since its evaporation produces considerable refrigeration.

One of the most important and surprising new uses for compounds present in refinery gas is the employment of propane as a refining agent in the manufacture of lubricating oils. The various crude cuts of lubricating oil as obtained from most crude oils contain either four or five kinds of undesirable constituents which need to be removed in order to make high-quality lubricating oils. These are (a) paraffin wax, which should be removed to permit a low pour point; (b) asphaltic compounds, the removal of which is necessary for several reasons, including excessive sludge- and carbon-forming tendencies; (c) the heavy ends of the lubricating cuts, which also have high carbon-forming tendencies; (d) the naphthenic compounds, which are in general responsible for poor viscosity characteristics and low resistance to oxidation; and (e) color bodies, which need be removed primarily in order to render the oil marketable.

For the past fifteen years refinery laboratories sought fervently for selective solvents which would do a better job than sulphuric acid and other refining agents in



removing the undesirable constituents but never found one which was of much value for removing more than two or three of them. All this time in their own backyards, however, were thousands of tons of propane gas which, when liquefied under pressure, had the amazing property of acting as an antisolvent tending to remove every one of the five. As a matter of fact, for the removal of the first three, namely, wax, asphalt, and heavy ends, propane gas is in general more efficient than any other known solvent. It has the further advantage of removing each of these three separately from the others, which greatly facilitates by-product utilization.

Propane owes its versatility as a precipitant largely to the fact that its solvent properties change rapidly over the convenient temperature range between its boiling point,  $-44$  degrees Fahrenheit, and its critical temperature,  $-212$  degrees Fahrenheit, so that it really possesses the properties of a whole series of different solvents. As it approaches the critical point, it gradually loses its solvent powers—in fact, highly compressed propane gas at  $250$  degrees Fahrenheit is a better solvent for heavy oil than is liquid propane near its critical temperature.

More important from a volume standpoint are other growing uses for liquid propane: as bottled gas for cooking and heating where city gas is unavailable; as industrial fuel when accurate control and low sulphur content are important; and as an enriching agent for city gas. The total consumption in these fields amounts to around a hundred and fifty million gallons yearly.

The fascinating story of refinery gases as raw materials for the American chemical industry really began only about eighteen years ago, when propylene in cracked gases was converted into isopropyl alcohol, a product then selling at prices up to \$7.00 a gallon and enjoying a modest demand as a substitute for ethyl alcohol on account of the many restrictions surrounding the use of the latter. Needless to say, this synthesis reduced the price very rapidly, until today it is about one-twentieth of what it was, and uses have multiplied correspondingly. The synthesis of ethylene dichloride and ethylene chlorohydrin, from ethylene, followed closely and resulted in a considerable cheapening of these reagents. The next important product to be made synthetically from cracked gas, ethylene glycol, began to be produced about 1922. Glycol was then a chemical rarity practically unknown in industry, and the development of uses for it was a major problem. Its outstanding merits as an antifreeze, however, soon developed a mass market. Since then, many other uses have been found; for example, nitroglycerol is largely used in conjunction with nitroglycerin, especially to make low-freezing explosives. The related compound, diethylene glycol, is increasingly used as a glycerin substitute for the moistening of cigarette tobacco.

While glycol, ethyl alcohol, and isopropyl alcohol are the three most important primary products synthesized from cracked gas, a single company is today making commercially more than a hundred synthetic chemicals starting from ethylene, propylene, or the butylenes, including at least twenty-four alcohols and alcohol ethers, four ketones, twenty-three esters, fourteen amines, eight ethers, and many others.

The simplest reaction of the olefins in cracked gases is their conversion into the corresponding alcohols by absorption in sulphuric acid and the hydrolysis of the resulting sulphates. Each of the principal olefins in refinery gas is being thus used commercially—indeed, the present plant capacity for making synthetic ethyl alcohol is equal to about half of the total industrial alcohol demand of the country. Less than half of the synthetic product, however, finds its way into this market, the larger portion being used as an intramural raw material for other synthetic products.

Practically all of the isopropyl alcohol and the secondary and tertiary butyl alcohols on the market today are made from petroleum gases. Most of the acetone consumed today is made by the catalytic dehydrogenation of isopropyl alcohol, and acetone is in turn converted into acetic anhydride, which is of such importance in the manufacture of cellulose acetate. The rapidly growing importance of cellulose acetate in this country results chiefly from the availability of this very cheap acetic anhydride.

An equally important general reaction of the olefins is that with chlorine in the presence of water, producing dichlorides which are useful as solvents, and chlorohydrins which are useful in many reactions, particularly in hydrolysis to form the corresponding glycols. Ethylene dichloride is finding increasing use as a principal raw material in the making of the rubber substitute Thiokol. Vinyl chloride, generally made by treating ethylene dichloride with alkali, is of great importance as the starting point in making the polyvinyl resins used widely as insulating compounds and rubber substitutes. The copolymer of vinyl chloride and the vinyl acetate is widely marketed as a plastic under the trade name Vinylite. The acrylate and methacrylate resins can also be made starting with petroleum gases, ethylene chlorohydrin and acetone being the respective starting points for cyaniding. Ethylene dichloride can also be reacted with ammonia to produce a series of amines which are now available commercially.

An interesting synthesis recently discovered in this field is that of glycerin, which can be made by the regulated chlorination of propylene followed by hydrolysis under certain special conditions. While the synthesis is not yet commercial, it is a real possibility in case the price of glycerin should skyrocket because of war demands.

The paraffin hydrocarbons are not so reactive as the olefins, and hence their most important chemical use has been conversion into olefinic gases either by cracking or by catalytic dehydrogenation. Butylene can be further dehydrogenated to butadiene, and butadiene in turn polymerized into the familiar Buna rubber. Chlorination, oxidation, and nitration have been applied to others of the hydrocarbons, with generally limited commercial results.

The principal chemical use for methane today, in addition to its conversion into carbon black and related blacks, is the production of cheap hydrogen. It now appears, however, that hydrogen can be made more cheaply in an oil refinery by the catalytic dehydrogenation of either naphtha or of propane and butane. Another use of methane is its oxidation (*Continued on page 248*)





Commission of Fine Arts

# How Efficient Is the State?

## *Democracy Must Reckon with the Temporary Advantage Possessed by Authoritarianism in Making Essential Adaptations to Science*

BY STUART A. RICE

THE question which I seek to analyze is that of the comparative efficiency of democratic and authoritarian institutions. By efficiency, I mean what the engineer would mean by it, namely, the ratio between the product of a system and the energy put into it. The ultimate form of the product of social and governmental systems is presumed to be human welfare, but it appears more immediately in those forms of economic, social, and military vitality upon which nations have always depended in their competition for survival and power. Social institutions may be regarded as dependent variables—dependent, through many intermediate channels of causation, upon the development of science, which, following William F. Ogburn's analysis in *Social Changes*, we may consider as an independent variable. Within the term science we include technology. The efficiency of social institutions depends upon their capacity for adaptation to science. Since among the claims made for authoritarian states the claim of superior efficiency is much emphasized, it is significant that when science is removed from a democratic setting, and is subordinated to nationalistic ends, the question of the adaptation of the state to science is not unlike that of the adaptation of a gourmand to a carefully fattened turkey before Thanksgiving.

In analyzing this question, I wish to make the comparison as the scientist or engineer would make it, uninfluenced by the predilections for democracy which I avow. In the hope of illuminating the question and possibly adding to its precision, I will rephrase it in several forms: Can democratic institutions hold their own in the present struggle

for survival between them and the institutions of authoritarian nations? Is democracy efficient enough as an organizing principle among people who have reached our own level of scientific attainment to compete on equal terms with the organizing principle of dictatorship? If democratic institutions as we know them are lacking in efficiency, do they possess the capacities to acquire some of the efficiencies made possible by dictatorships—but within the essential framework of democracy?

From the standpoint of comparative efficiency, the social systems of Germany, Russia, and Italy appear to have two types of advantage. First, and most obvious, by impairing individual initiative they have converted, or seek to convert, the state into an integrated social, economic, and political mechanism. All parts of society are expected to contribute harmoniously to the attainment of consistent, centrally determined objectives. These states are, that is, totalitarian. The purge of individuals or the suffering of particular social classes is justified in totalitarian philosophy as merely incidental to the welding of a strong nation and the harmonization of its purposes, like the sloughing off of diseased or obese tissues from the human body.

Second, and necessarily, these totalitarian states are authoritarian. They are not impeded in their adaptation of means to ends by the accumulation of habits, conventions, prejudices, and superstitions which retard the utilization of new methods by individuals who are left to make their own decisions. Authoritarian states have the ability to shorten what Ogburn has termed the "social lag."

Above:  
"The Signers of the Constitution," a mural by Barry Faulkner in the Archives Building, Washington, D. C.

These seeming advantages, in my opinion, are in part real and in part illusory. In seeking to analyze them, we must observe a distinction between efficiency as a long-run phenomenon and efficiency as a short-run competitive advantage. I will contend that the efficiencies which result from the totalitarian character of a society are of the short-run variety. On the other hand, the ability to shorten the social lag offers a longer-run challenge to democratic societies which it will be expedient for them to meet, if they can, by emulation.

The totalitarian state in its authoritarian aspect is not without support from psychology and sociology. Among man's deepest longings — contradictory to other longings, it is true — is that for subservience to competent authority: to a personal deity who can say, "Let there be light!" and there is light; or to a leader who can say, "Do this!" and one obeys. I recall little Mildred in the "modern" kindergarten: "I'm tired," quoth she, "of doing just what I want to do all day long!"

In a static, unchanging world much more could be said on behalf of external authority as a principle of social organization. Such a world is that inhabited by many species of insects, like the ants, among whom instinct serves the role of dictator. But in a world of constant change under the impact of science, the capacity for adaptation is a human characteristic of the utmost survival value. Human beings must learn by trial and error to make their own selections from experience — little Mildred to the contrary notwithstanding — if they are to be capable of adaptation to changing environments. Discipline and capacity for sacrifice are essential to racial and individual perfection, but these virtues are not equivalent to unquestioning obedience to a *Führer*. They are inseparable from freedom. They are attainable only to those who are mentally at liberty to choose, for they come from within.

The spurious "discipline" of the Nazi storm trooper or the ignoble "sacrifice" of the pitiful Muscovite in the Arctic wastes of Finland does not differ essentially from the compliance of those inert materials out of which the engineer fashions the cogs and pistons of his machine. The social mechanism of the totalitarian state, like the material mechanism produced in the foundry, will be efficient only so long as its direction is efficient. It will fail from a lack of regenerative and adaptive capacities at those critical points in the long run when the directive authority outside itself begins to falter.

It will fail, too, because science and intelligence are themselves among the materials rendered inert when placed beneath the yoke. I believe that democracy and science are native allies. It is only in a democracy that the basic conditions of continued scientific progress can be provided. Dictatorship is destructive of intellectual integrity, of freedom to pursue scientific interests without interference, and of that essential exposure of the work of the scientist to the free winds of competent criticism.

The efficiency of the totalitarian state, then, so far as this is derived from its dictatorial character, can be regarded as a short-run efficiency. In the long run it is doomed to fail in competition with democratic institutions, if they meanwhile survive to meet the test,

because these latter, relatively inefficient in the short run as they are, are nevertheless independent of directive and energizing forces outside themselves.

But you have noted my qualification. The *Blitzkrieg* is not limited to military strategy alone. What if democratic institutions should be destroyed within the short-run period during which the totalitarian state shows superior competitive advantages? Science itself would share in the general disaster; and with it would go the hope — for some centuries, perhaps — of reconstructing democratic institutions. The subordination of science to the totalitarian state is a case of killing the goose that lays the golden eggs. Yet killing the goose to secure a small but immediate addition to the gold supply is a not unreasonable policy for those who are confronted with alternatives of domination now or never. It is clear that democracy must look to its short-term competitive position.

This brings us to a consideration of the lag between the changing material conditions of life, which directly reflect the progress of science, and the corresponding adaptive changes in governmental, industrial, and social organization. I shall ask you to consider to what extent adaptation has occurred in some aspects of government, and first of all in the mechanisms of legislation.

As a legislative mechanism, the New England town meeting was adapted to the material conditions of a sparse population in a preindustrial, agricultural economy based upon small holdings. Road building, education, relief, delinquency, were collective problems of the local community. Everyone was able to form competent opinions concerning them and hence to participate, directly and efficiently, in the formation of whatever decisions respecting collective action were required.

Then came the industrial revolution as an outgrowth of scientific development. The old collective problems ceased to be local in their scope. They began to extend, first to the state and ultimately to the nation. At the same time they became enormously technical and complex. Dirt turnpikes became super-elevated concrete highways, nationally routed from coast to coast. Crime waves became state wide and national. The education of children and the relief of adult populations stranded in backward or depressed areas by the exigencies of an interknit national economy are today no longer within the capacities of tens of thousands of local communities or of many of the individual states. And to the old collective problems were added new ones surpassing in their technical intricacies the possibility of conception by the rugged individualists who laid down the basic framework of our legislative system.

A partial adaptation of the legislative process to science — the latter as reflected in the present breadth and complexity of these social and economic problems — has been made. Since most public issues could no longer be settled directly by the people physically gathered together in town meetings, representative government has largely replaced pure democracy as the basic instrument for the expression of popular will. But the no longer valid assumption of competence by the electorate to settle these issues directly still persists. It has been carried over into the framework and methods of legislative bodies.

(Continued on page 253)



# The Teaching of Architecture

*Free Trade in Ideas Is Essential to Rational Progress;  
Theory and Practice of Design, Through History  
and Principles, the Basic Instruction*

BY WILLIAM R. WARE

**N**EARLY seventy-five years ago, William Robert Ware, the first Professor of Architecture in the then newly founded Massachusetts Institute of Technology, outlined a method of applying "the principles and ideas of the Institute to the most ancient of arts, — the art of Building," suggesting how the school could give much needed assistance to architect and draftsman, and through them to the public, and stating not only aims but also methods. Out of mind for almost three-quarters of a century, Professor Ware's essay — one of the earliest plans for formal college courses in architecture and one of the most thoughtful considerations of the art itself — is of historical importance both as record of how professional instruction in the subject began in the United States and as summation of the philosophy of architectural teaching. This abridgment preserves the salient features of the original.

**S**UCH instruction as is here proposed [in the Course of Building and Architecture set forth in 1866] is not now anywhere offered, it is believed, within the limits of the United States. While almost every other one of the important branches of applied science has multiplied seminaries in every part of the country, the art of building, upon which more money is spent, and more money misspent, than upon any other, is handed down from generation to generation by personal tradition alone. In former times, the system of apprenticeship served a certain purpose in preventing this work, which especially needs to be done with deliberation, learning, and reason in design, from coming under the sway of haste, ignorance, or caprice. But the system of apprenticeship has disappeared, as being unsuited to the temper of the time; and no other sufficient means of education has yet taken its place.

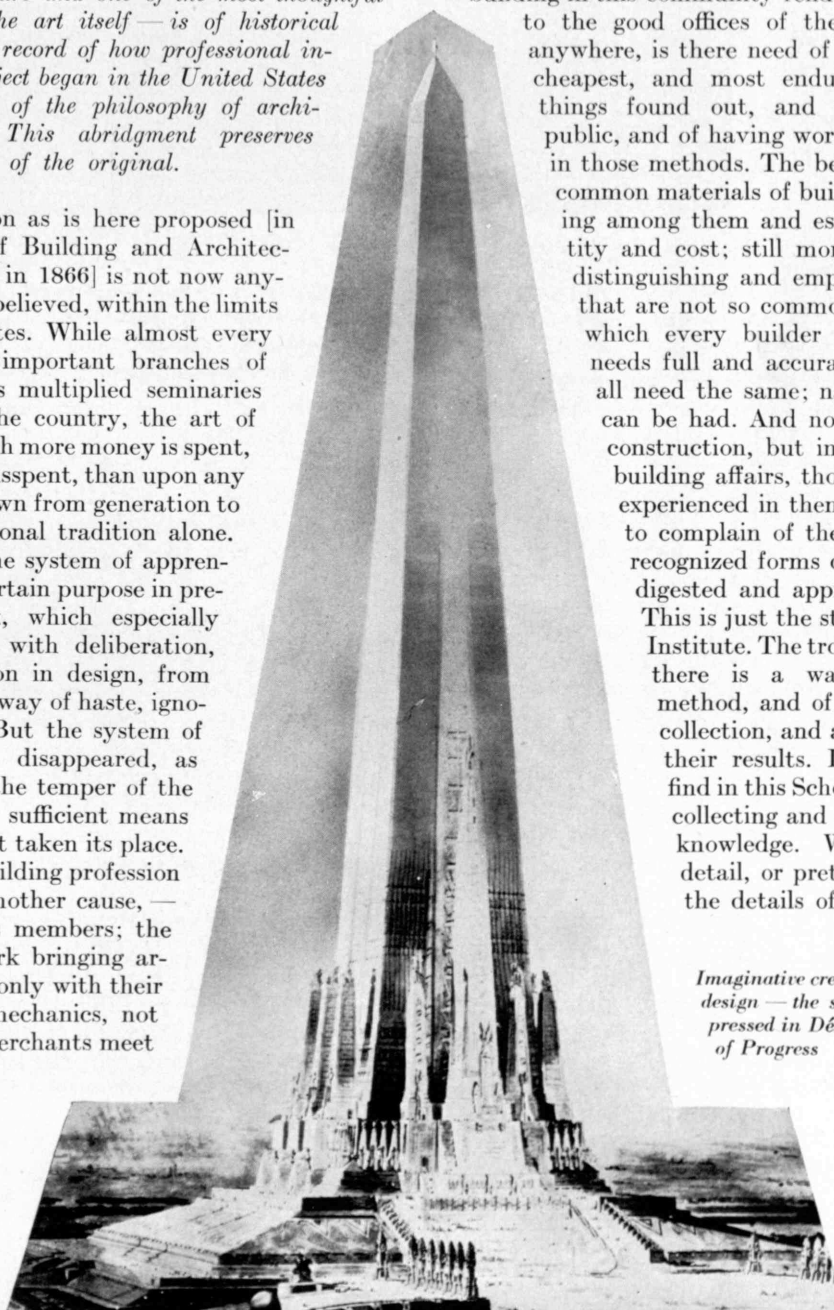
Meantime the building profession is suffering from another cause, — the isolation of its members; the nature of their work bringing architects in contact only with their clients and their mechanics, not with each other. Merchants meet

upon change, and lawyers in court; clergymen and physicians have stated means of seeing each other, and keeping up with the times. Architects never meet; and the profession presents the singular spectacle of . . . men . . . engaged in the solution of the same problem, never comparing results, or profiting by each other's experience.

Setting aside then, for the present, any question of Fine Art, it will not be denied, that, regarded merely as one of the useful arts, the position of the art of building in this community renders it peculiarly open to the good offices of the Institute. Here, if anywhere, is there need of having the simplest, cheapest, and most enduring ways of doing things found out, and when proved made public, and of having workmen trained to skill in those methods. The best ways of using the common materials of building, of discriminating among them and estimating their quantity and cost; still more, the best ways of distinguishing and employing the materials that are not so common, — are matters on which every builder and every architect needs full and accurate information. And all need the same; namely, the best that can be had. And not only in matters of construction, but in the whole detail of building affairs, those who are the most experienced in them are the most ready to complain of the want of system, of recognized forms of procedure, of well-digested and approved methods. . . .

This is just the state of things for this Institute. The trouble is technological; there is a want of system and method, and of means for a general collection, and a general diffusion of their results. It seems possible to find in this School the means both of collecting and of disseminating this knowledge. Without going into detail, or pretending, indeed, that the details of the scheme are yet

*Imaginative creation in the realm of pure design — the spirit of a nation as expressed in Désiré Despradelle's Beacon of Progress*





worked out, which they are not, it is enough to say, that the School may perhaps be availed of, not only to give to draughtsmen and students a sort of training they cannot easily find elsewhere, but it may act through them as a sort of professional exchange for builders and architects. . . .

The regular pupils within its walls would proceed to collect, under the guidance of its officers, the best information that can be obtained from the accredited sources; while the pupils attached to the offices in the town would lay them under contribution for the fund of special study and personal experience peculiar to each. All would use every opportunity to increase their resources by observing work actually in progress, and by conversing with mechanics. Upon a comparison of results, the particular subject in hand would probably prove to be pretty well exhausted; at any rate, all the questions that were not answered would be very distinctly asked, and their discussion would point the way for a really advanced research. A method of study more edifying for the students, it would be difficult to name; while for the profession it would establish at once a sort of architectural exchange, or clearing-house for the interchange of knowledge and skill: only, instead of a striking of balances and a payment of trifling differences, some of gain and some of loss, each would carry away what all had brought, while the whole would remain behind. The sum of available knowledge would be increased a hundred-fold. The offices would be enriched by the returning streams, and the School would accumulate, from year to year, a priceless treasure of traditional lore.

Such studies and researches would make the student more conversant with every variety of the practical and business affairs with which he is expected to be familiar, than he could probably otherwise become, except by a personal experience in each. But life is too short, and the range of studies too extensive, for so slow a schoolmaster. A certain amount of experience is of course necessary, at last, to transform the student into the man of business: this he must obtain while serving as an assistant or draughtsman in an architect's or builder's office; and the more complete his previous theoretical knowledge of his subject, the more rapid will be his progress in this practical schooling. Enough experimental acquaintance with it to make these studies and researches intelligible and really instructive can be gained from the systematic study of buildings actually in progress, from laboratory manipulations, which should be made to embrace as great a variety of work as possible, and especially from the collections of illustrative drawings and models which must form an essential part

of the equipment of the School. Meanwhile, the courses of Chemistry, of Geology, and of Engineering, which are open to these classes, afford a scientific discussion of the nature and strength of the materials used in building, of the stability of structures, of the principles of masonry and carpentry, and of the theory of trusses, beams, and arches. This various knowledge is just what is needed in the solution of the problems or examples in construction. It is proposed to assign to the students as a subject for study some definite structure in brick, stone, wood, or iron, and call upon them to prepare working drawings, full specifications, estimates of quantity and cost, and calculations of weight and strength, accompanied by a

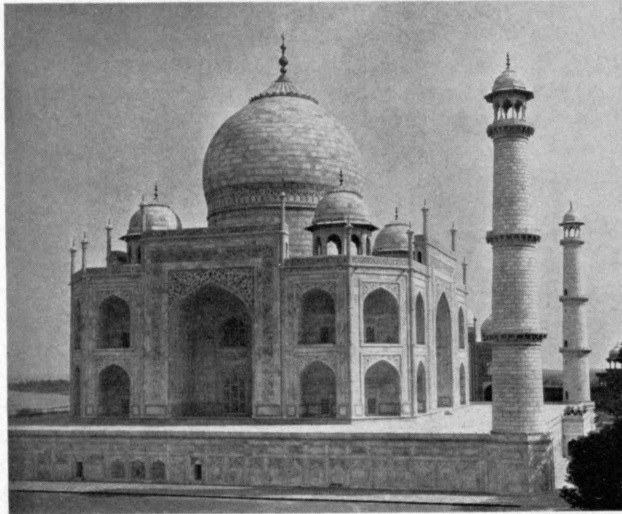
general description of the work. These programmes should not be too difficult. A good many short exercises of this sort are more edifying than a few very long ones.

[Stressing the usefulness of this practical training to the building industry through improving the quality of apprentices, "upon whom the whole system turns," Professor Ware argues that the School should give a thorough, practical course for draftsmen, a liberal culture so far as it went, enabling "him who stopped at the lower landings at least to appreciate the heights above him." The facts which these students search

out will, with systematic arrangement, eventually give the building industry "the benefit of the best ideas of the time." Professor Ware asserts that "there can be no rational progress without a free trade in ideas."]

Thus far with the useful art; thus far we have had to do with Building proper, and with the instruction we propose to give in its methods. But we have to take up the subject also in its relations to fine art: the School cannot, if it would, avoid the consideration of Architecture proper, into which building naturally grows as it assumes the beauty, first of fitness, then of expression, then of grace.

Architecture is indeed very much like literature, not only because it has the same curiously ambiguous character as language, being partly a matter of history, partly of natural history; half a natural product, half a product of human will; both being founded in the immemorial past, and exhibiting in their development the same subtle influences of race and climate, similar laws of tradition and derivation, a constant resolution and recombination of elements, all controlled by æsthetic laws, which spring partly from the nature of things, partly from custom or caprice, — but also because, in an essential characteristic, architectural work is like literary work. Both writing and building range all the way from mere work of necessity, the satisfaction of every-day requirements, up to the pure expression of abstract sentiment, where the form, not the function, is all in all. Upon this lofty level, this Parnassian height,



*Inspirational design for useful purpose — the Taj Mahal*

the home of genius, literature and architecture become poetical: they are transfigured, and mingle on equal terms with painting, sculpture, and music. But they differ from the other fine arts, and they differ from the merely useful arts, in this, that there is in each an intermediate region, above the reign of mere utility, though still mainly utilitarian; and below the realm of poetry, though still thoroughly artistic. This middle ground is in literature the field of liberal education, and in architecture the field that we propose to occupy. It is the region of good sense and good taste, of knowledge and skill, of intelligence and refinement, and of talent, perhaps, rather than genius. The fruit of its cultivation is in literature a prose style, clear, graceful, and intellectual; and a style in building, simple, elegant, and rational, suited to the best requirements of every-day life.

In a certain sense, indeed, Architecture may be called the prose, as sculpture and painting are the poetry, of art. Its first principles are truthfulness, good sense, and perspicuity. In its higher walks, it grows eloquent and rhythmical; highly poetical in form and in purpose; aiming at the expression of sentiment more than of use, in a purely oratorical spirit: but, even here, intelligence and sound reason exert a controlling influence, and elsewhere they rule with absolute authority. Considerations of method, order, form, clearness, precision, and sobriety, are what make a good working style, both in writing and in building; and they demand the same qualities in the workman, — a quick and sensitive intelligence; an open, flexible, and cultivated mind. In both, the higher paths can be trod by genius alone. That work can wait till genius comes. But there is in both a great and indispensable work, a work that cannot wait, a work which every-day necessities require to have done somehow; and it is of the highest advantage to the culture of every community, that in this work, both of literature and architecture, the best methods and ideas should everywhere prevail.

It is in establishing a high critical standard of performance in work of this sort, that, as I have said, educational institutions find their proper vocation. And it is as true here, when we are treating of style, as it was

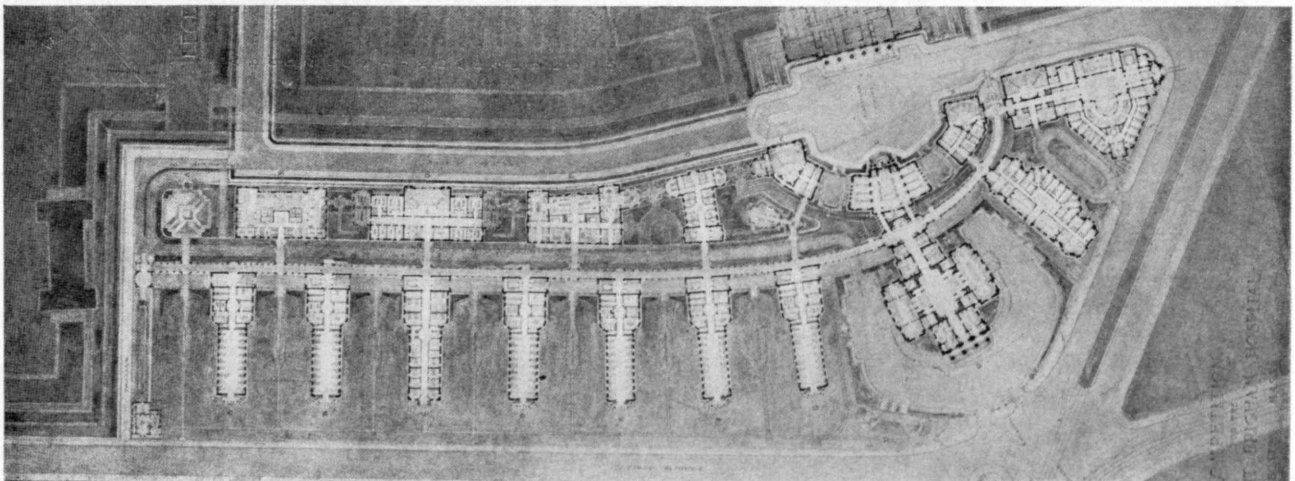
just now when we were speaking of the mere utilities, that, in the nature of things, an organized institution has, in this work, altogether the advantage of private enterprise. . . .

It remains, then, for us to consider how we had best take up this instruction in Architecture proper, so as to inculcate sound and serviceable ideas in regard to architectural composition and design. There may be good building without it; but there can be no good architecture unless it is taught, and taught well. The question is twofold: what shall be taught, and how shall the instruction be given?

The first part of the question is already answered in general terms. The thing to be taught is the theory and practice of architectural design; and this is to be learned by studying its history, which everywhere illustrates its principles, and its principles, everywhere illustrated by its history. These principles have an independent existence and an abstract value; they are unchanged through all the changes of the past; and it is by their light, not by following the precedents of by-gone ages, that we must hope to find, for the new and strange problems of the future, the simple, truthful, and characteristic solution they demand. . . . What course of study can satisfy the legitimate demand of the student for such a knowledge of the past, as shall fortify him with all the experience of the race, and, at the same time leave him free from prejudice and pedantry, and the prestige of authority, to apply these principles simply and frankly to the work of the future and the present?

It is perhaps not impossible to meet, or rather get round, the difficulty . . . of discriminating nicely between memory and invention, between pedantic learning and wholesome knowledge; the forbidden work of copying, and the legitimate and indispensable work of imitation, by keeping the two things as far apart as may be to start with; and not letting students enter the region where the difficulty and conflict are felt, until they are somewhat robust and mature through practice and experience. . . . There might be one course of design founded on general principles, — the laws of harmony and proportion, the study of natural forms and their conventional adaptation to design, of the contrast and

*Beauty of design and pattern can mark the plan as well as the ultimate building — Despradelle's design for the Peter Bent Brigham Hospital, Boston*





gradation of color and form, and the expression and composition of abstract lines. This would be the æsthetic training, and the useful should accompany it. . . .

Such a course is, I know, open to the reproach of attempting to reconstruct civilization out of abstract ideas, and of trying to make students learn to design buildings out of the depths of their own consciousness. It is not impossible that serious objections are to be urged against it on theoretical or practical grounds, and it should of course, before being put in practice, be subjected to every test which criticism can bring to bear upon it.

These inventive studies I would alternate with other studies purely acquisitive; the deductive and synthetical method should give place to the inductive and analytical; the class now taking up a purely historical course, and discussing one by one, in their order of development, all the great styles of the past. . . .

[Critically examined for illustration of permanent and universal principles, these styles should be studied as an expression of the age which produced them. The students should be encouraged to ask not only what was done but also why. All other courses would be oriented toward the period being studied, and students would make a design upon the subject assigned — “a restoration, or perhaps a simple original building, *not a modern building in the ancient style.*” The moral qualities of the ancient work, as distinct from æsthetic qualities, should be observed; “it is important for criticism to note, that truth may exist without beauty, and beauty without truth. . . .” Stimulation in design would result from these historical studies.]

To say that such a result supposes, on the part of the pupil, talents of no common order, is true: indeed, only the man of genius could carry such a system to its final success. But this is only saying that the future problem of architecture is one which it requires the highest order of mental power to solve, which nobody would deny. What I would claim for such a system of instruction is, not only that the best minds might be subjected to it without injury, — a thing that can be said of but few of the methods of instruction now in vogue in any department of learning, — and that their best and most sensitive capacities would be by it fostered and generously developed; but that it would afford a wholesome and manly school for the development of any mind. . . .

The remaining question — how all this instruction shall be given — depends for its answer upon the appliances the Institute can bring to bear upon it, and upon the condition of the profession in this community. . . .

The School would, of course, prescribe the work to be done, month by month; give out the problems to be solved, . . . fix the times and conditions of examinations, and appoint the examiners. The principle that instructors should not sit in judgment upon the work of their own pupils should be strictly adhered to. . . . The great stimulus to be derived from the exhibition of the competitive drawings, and the publication of the names of the successful men, should not, of course, be foregone.

[The Institute is undertaking a difficult and delicate task in attempting to establish an Architectural School. A thoroughly elaborated scheme is essential to making the desired right start.

Formation of habits of thorough study is the chief question. “The curriculum indicated would not probably be found in practice so formidable as it perhaps appears. . . . Still Art is long, and the time given to its study cannot be short.” Hence the program must be sufficiently flexible to allow the student to decide how much study he needs or can afford. His position will be determined not by the time he has spent but by the progress he has made. Much may be done to save time by providing apparatus and systematizing labor. Extensive apparatus is indispensable. Collections of all sorts illustrating design and the history of art should be had. “Photography offers to bring the whole world to our door; and a systematic collection of architectural photographs . . . would be an invaluable and indeed an indispensable auxiliary.” The whole course offers a singularly attractive means of obtaining a general education, and hence has an interest for the public at large. “For the last four hundred years, literature has been the only avenue to a liberal culture: but before the revival of learning, architecture served, to a great extent, to fill this office; and it would be hard to find a study now, in the modern reaction against an exclusively literary training, better adapted to the wants of those who wish to try experiments in education.”]

By addressing itself to that which I have ventured to call the *prose* aspect of Architecture, that aspect which it presents when regarded neither as a fine art altogether, nor yet as mere building, and in which it appears rather as one of what are called now-a-days the Industrial Arts, or arts of design, the School hopes to avoid certain difficulties, both of theory and practice, which perplex the path of those who take in hand the highest artistic training. The highest attainments in the fine arts can be reached only by men of genius; and it is a question not easy to answer for those, the success of whose undertakings depends upon an unlimited supply of this rare and delicate staple, how men of real genius are to be found, and, when found, how they are to be treated so as not to diminish or quench the heavenly spark. By directing our methods to meet the wants rather of talent and intelligence, of the common mind, not of the exceptional mind, we give prominence to what must always be the main work of a school, and, as I have said, steer clear of these perplexities. At the same time it is undoubtedly the office of a first-class school, as has been well said of late, not only to “give all its students as high a culture as they can receive, and thus steadily raise the tone of the community by sending in a constant influx of cultivated minds, but also to develop to the highest point minds of the first class.” Now, the most efficient agency for bringing out all the powers of first-rate men has been found, both in literature and in architecture, to be that of competitive examinations of great difficulty, in the preparation of which every facility is offered, but all possible freedom allowed; and for which the prize shall be not only honorable in the highest degree, but shall have, if possible, a real value. This last provision is not necessary at any given moment to get the maximum of work out of the competitors; the honor suffices for that; but it is of great use in bringing into the school the best talent from the largest community. . . .

The system [of prizes] is indeed very liable to abuse, and has undoubtedly, when injudiciously administered, led to evils which it must be our care to avoid, taking warning, as well as example, from the experience of others, but some such system (*Concluded on page 257*)

---

# THE INSTITUTE GAZETTE

---

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

---

## At the Ten-Year Mark

### *New York Club Honors Dr. and Mrs. Compton at Notable Celebration of First Decade of His Administration*

ON March 5, 1930, members of the Institute's Corporation quietly celebrated. They celebrated, we now know, because they had received word that a man had changed his mind and had decided to accept their invitation to be president of the Institute. Ten years later, on the evening of March 5, 1940, 700 Alumni, members of the Corporation, and guests assembled to celebrate again this change of mind — this time with an enthusiasm which no longer needed to be *sotto voce* and which indeed could not be expressed in any quiet way.

The occasion was the dinner given in honor of President and Mrs. Compton at the Waldorf-Astoria by the Technology Club of New York on the tenth anniversary of Dr. Compton's acceptance of the presidency of the Institute. In every respect the dinner was an appropriately distinguished occasion. For the dinner and for the reception and dance which followed, the stars themselves were fittingly arrayed, as Harlow Shapley pointed out in a telegram to Dr. Compton: "As a happy augury on this important occasion I have arranged a display of all the major planets across the western sky, from Mars above Bethlehem and Pittsburgh to Venus overhanging Hollywood, and ordered that they continue to follow your brilliant example and continue to radiate beneficently on a planet that much needs light and beneficence."

The toastmaster was C. G. Dandrow, '22, who ran the dinner with precision and pace. He presented the evening's speakers: Alfred T. Glassett, '20, Vice-President of the W. J. Barney Corporation and President of the Technology Club of New York; Eric Hodgins, '22, publisher of *Fortune*; Vannevar Bush, '16, President of the Carnegie Institution of Washington and formerly Vice-President of the Institute; and Frank B. Jewett, '03, President of Bell Telephone Laboratories and of the Alumni Association of the M.I.T.

Mr. Glassett, with the enthusiasm which has marked his presidency of the Technology Club of New York, expressed the esteem and affection of Alumni of Greater New York for Dr. and Mrs. Compton. He emphasized Dr. Compton's role in the growth and revivification of the Club, and remarked on the Club's bright future in its quarters with the Williams Club at 24 East 39th Street.

In speaking of Dr. Compton's achievements "in general," Mr. Hodgins commented thus upon the decade being signalized: "What a wonderful decade for the Institute, what a melancholy decade for the country as a whole or the world at large. The national and inter-



President Compton

*Underwood and Underwood*

national news in the papers that day [March 13, 1930, when news of Dr. Compton's acceptance was made public] was mostly bad or stale or unhappy, and clear as could be there were foreshadowed in the business figures the dreary years that lay ahead. What has this got to do with Dr. Compton's achievements 'in general'? I think it has a very great deal to do with them. I think the first thing we should remember about these accomplishments is that they took place not against a national backdrop of prosperity, patriotism, courage, or joy in living; instead, they were achieved while the very spirit of the time was on its way to sorrier and sorrier morasses of misunderstanding, confusion, defeat, and despair. Even more, however, the contrast between the decade that the world was about to endure and the decade that the Institute was so happily to experience suggests that whereas the Institute had a leader who knew where the answer to our modern problem lay, the country had leaders who did not. 'Only the game fish swims upstream,' wrote Grantland Rice in a poetical mood a year ago. Throughout the whole of the Threadbare Thirties, as I have heard a well-known magazine describe them, Dr. Compton swam upstream."



Maintaining that Technology is singularly fortunate in the relationship existing between the institution and its Alumni, Dr. Bush said: "When I look at M.I.T., Dr. Compton, I find an alumni body of which you may justly be proud. Why is it that this is extraordinarily true at M.I.T.? I give you three reasons: First, the Alumni of M.I.T., like the student body, are a clear-thinking group, with a vivid idea of what they wish to accomplish in this world and a practical approach to their problems which emerges from a background of science and engineering. Second, M.I.T. Alumni recognize that in their institution they have an effective and efficient agency for implementing that altruistic urge which resides in all men of good will; in short, it enables them effectively to help their fellows. Third, and this is the most important reason — and here I turn from you, Dr. Compton, and address the Alumni — they have a leader of great vision, great capacity, great generosity, great kindness, the inspiration of whose leadership permeates every corner of the institution, spurring the Faculty on to higher accomplishment, earning the confidence and support of the governing Corporation, inculcating in the student body the fine ideals which professional life demands, and, finally, reflecting into alumni thought everywhere his unselfishness and devotion to a cause which is worthy of the best efforts of all of us."

Said Dr. Jewett: "In none of my friendships have I been more fortunate than in that of Karl Compton. When I came first to know, like, and admire him, I had no means of knowing that he was destined to be a truly distinguished man who would exercise great influence over men, their affairs, and the affairs of their community life. That he was bright, friendly, upright, devoid of affectation, and endowed with a wonderfully sweet disposition was patent. So too, however, were many others of his generation. It was not until long after I first came to know and esteem him that it dawned on me that in him these qualities and others were assembled together in those proportions which set him apart from others and among that limited category we designate as leaders. We who have a deep interest in M.I.T. and its future can take great satisfaction that Karl Compton has been its president and our leader these past ten years. Such satisfaction is not merely the pride in the standing and prospects of an institution which has played an important part in our individual lives but rather satisfaction in an institution which is a powerful force in the intellectual, spiritual, and economic life of the nation. What has been accomplished during the past decade in every sector of Institute affairs, both internal and external, is an astounding performance. It would have been a noteworthy achievement in any decade. That it should have been done in a decade of stark depression when all the old markers were falling or under the attacks of blind rage, when men had lost faith in themselves and were blaming much of their distress on the very things for which M.I.T. is a symbol, makes the achievement almost incredible."

To these benign assaults upon his modesty, Dr. Compton of course replied, taking cover behind the doctrine that he had merely served as a catalyzer in promoting the activities of the Institute.

Unannounced on the program but one of the high points of the evening was the presentation by Robert E. Wilson, '16, of a sterling-silver tray to Mrs. Compton. Responding, she recounted the part played by Dr. Jewett and others in Dr. Compton's acceptance of the presidency, and brought down the house by the friendly warmth and the wit of her impromptu remarks.

That the celebration and esteem extended far beyond the banquet hall was shown by the scores of telegrams which kept messengers at the Waldorf busy. Of those read by Mr. Dandrow, the following two are typical as documenting the wide affection and respect for Technology's President. From Leverett Saltonstall, Governor of Massachusetts: "Sorry I cannot in person join Technology Alumni tonight in honoring Dr. and Mrs. Compton on tenth anniversary. Please convey on my behalf greetings of Commonwealth and my own warmest personal best wishes. In decade of his administration he has not only served the Institute with honor but has advanced our commonwealth in realm of science and humanity. May you and all of us in Massachusetts enjoy for many more years the contributions of his talent; and he too be happy in the knowledge of his accomplishments and our appreciation." From a member of the Faculty: "On the occasion of this tenth-anniversary celebration our heartfelt gratitude extends to the committee of the Corporation who discovered and prevailed upon Karl Taylor Compton to accept the presidency of the M.I.T. and thereby brought to our Faculty a decade of inspiring association with a great leader who has made our life richer, our work more challenging, and our loyalty a privilege."

### *The Council Meets*

ALUMNI FUND policies, under the bylaws recently voted by the Alumni Association, are to be guided by an Alumni Fund board consisting of the Treasurer of the Institute, the President, Vice-Presidents, Secretary, and Treasurer of the Association, the Director of the Fund, and five Alumni elected by the Alumni Council from nominations submitted by its Executive Committee. The initial five, elected at the February meeting of the Council — the 211th — are Philip W. Moore, '01, Francis J. Chesterman, '05, Rufus E. Zimmerman, '11, H. B. Richmond, '14, and George E. Whitwell, '15.

At the start of the February meeting, President Compton, introduced by Raymond Stevens, '17, Vice-President of the Association, presented Detlev W. Bronk, director of the Eldridge Reeves Johnson Foundation for Medical Physics at the University of Pennsylvania and member of the Visiting Committee for the Institute's Department of Biology and Public Health.

Alumni Day committee chairmen were announced: Exhibits, Carlton E. Tucker, '18; Ways and Means, Horace S. Ford; Transportation, Alf K. Berle, '27; Registration, Robert M. Kimball, '33; Ladies' Events, Mrs. Murray P. Horwood, '19; Publicity, Ralph T. Jope, '28; Class Day, John D. Mitsch, '20; Banquet, Richard Whiting, '26; Luncheon, Edward R. Schwarz, '23.

Speakers of the evening were Herbert L. Beckwith, '26, and Lawrence B. Anderson, '30, architects of the swimming pool building, who explained and described

the structure itself, the special considerations entering into its design, and the special problems encountered in its construction. That the completion of a special structure such as this involves a merging of architecture, science, and engineering was clearly evidenced.

### Dean of the Graduate School

**H**ARRY M. GOODWIN, '90, Dean of the Graduate School and Professor of Physics and Electrochemistry, whose distinguished association with the Institute began fifty years ago, will retire in June with the rank of honorary dean. To succeed him the Executive Committee of the Corporation has appointed John W. M. Bunker, Director of the Research Laboratories of Biology and Professor of Biochemistry and Physiology.

Dr. Goodwin has long been active in developing the Institute's graduate courses, and the prestige of the Graduate School is due in no small degree to his able leadership. He was appointed dean of graduate students in 1926, and in 1932 he was made dean of the newly created Graduate School, becoming at the same time a member of the Institute's Administrative Council. He has been chairman of the Faculty for the past year.

Dean Goodwin was born in Boston in 1870. After completing his early education at the Boston English High School, he entered Technology as a student of physics. Following his graduation he carried on advanced studies in mathematics and physics at Harvard University for two years, at the same time serving as assistant in the Institute's Department of Physics under Professors Charles R. Cross, '70, and Silas W. Holman, '76. In 1892 he was appointed instructor in physics and was granted leave of absence to continue his studies abroad. At the University of Leipzig he studied under Wilhelm Ostwald in physical chemistry, Gustav Wiedemann in physics, and Carl Neumann in mathematics, and was awarded the degree of doctor of philosophy in 1893. He carried on research work at the University of Berlin during the winter of 1893-1894.

Upon his return to the Institute, Dr. Goodwin was placed in charge of laboratory instruction in general physics, whereupon he inaugurated lecture and laboratory courses in chemical physics and electrochemistry. Realizing the opportunities inherent in this field of applied science, he organized in 1909 a new course leading to the degree of bachelor of science in electrochemistry, the first degree of its kind in America.

The new Dean of the Graduate School will come to his post with a background of broad experience in administrative work and research in science and industry. As director of the Institute's Research Laboratories of Biology, Dr. Bunker has been active in co-ordinating the group efforts of physicists, chemists, and electrical engineers for the joint solution of important biological engineering problems. His long interest in the borderline sciences of biochemistry and biophysics led to the development of new standards of precise measurements in this field and the inauguration of many important research projects.

Dr. Bunker was born in Toungoo, Burma, British India, in 1886, the son of Baptist missionaries. His parents — Alonzo Bunker, D.D., and Louisa Bradbury



M.I.T. Photo

John W. M. Bunker, Dean-elect of the Graduate School

Bunker, daughter of Samuel Bradbury, an early editor of the *Boston Bee* — were among the first missionaries to sail around the Cape of Good Hope on the clipper ship *Winged Hunter*. He was brought to the United States when a child, and received his early education in the public schools of Providence, R. I., and Newton, Mass. Brown University graduated him with honors in biology in 1909 and awarded him the master's degree in 1911, and the doctorate in bacteriology in 1912.

Dr. Bunker started his teaching career as an instructor in sanitary biology at Harvard University, where he organized a new laboratory in sanitary engineering in 1911 and a course in bacteriology in 1912. From 1909 to 1912 he was a member of the firm of Browne and Bunker, sanitary consultants, and in 1910-1911 was analyst to the Rhode Island Shellfish Commission and sanitary consultant to the Rhode Island State Tuberculosis Sanatorium. The following year he took charge of the biological division of the biological survey of the Genesee River at Rochester. As director of the biological division of the Digestive Ferments Company, Detroit, from 1915 to 1921, he established the first source of supply of the dehydrated bacteriological culture media now used in bacteriological laboratories the world over.

Dr. Bunker joined the Institute's Department of Biology and Public Health in 1921 as assistant professor of physiology and biochemistry, became associate professor in 1924, and was promoted to the rank of professor



in 1928. He has been a member of the Committee on the Graduate School since 1921 and is a member of Technology's original patent committee as well as of numerous other Institute committees. In 1937, Dr. Bunker was chosen to take charge of the Institute's newly established Course in Biophysics and Biological Engineering, to the development of which he has given much study. He will continue to direct it for the present.

He is a fellow of the American Association for the Advancement of Science, the American Public Health Association, and the American Academy of Arts and Sciences, of which he was a councilor from 1932 to 1936. He also holds membership in the American Chemical Society, the Boston Bacteriological Society, and the Society of American Bacteriologists, having served as councilor of the latter society from 1918 to 1920 and as executive secretary of its research council in 1920. He is a past president of the M.I.T. chapter of Sigma Xi, and his other fraternities are Delta Tau Delta, Alpha Chi Sigma, and Delta Omega. From 1921 to 1927 he was a member of the faculty of the Bouvé-Boston School of Physical Education. Dr. Bunker served from 1916 to 1919 in the Michigan State Troops, first as a private and then as first lieutenant; and from 1924 to 1939 he held the rank of major in the United States Sanitary Corps Reserve.

With Professor Clair E. Turner, '17, of the Institute staff, Dr. Bunker wrote *Personal Hygiene for Nurses*, and he has written numerous scientific papers on bacteriology, sanitation, biophysics, and vitamins.

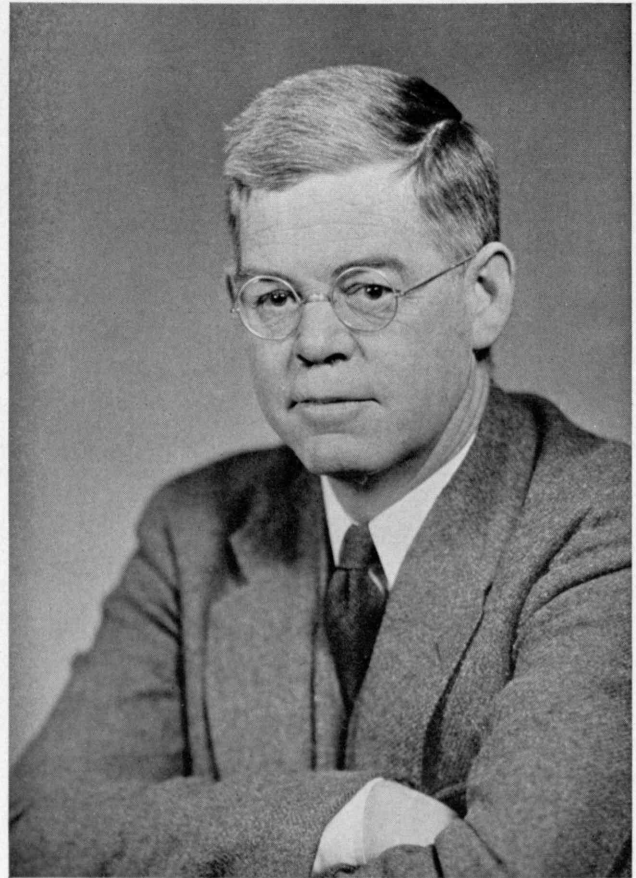
Dr. Bunker married Helen Francis Crawshaw in 1912; they have three daughters: Helen Bradbury, Margaret Bradbury, and Barbara Adams. Their home is in Belmont, Mass.

### Industrial Co-operation

NATHANIEL McL. SAGE, '13, who is widely known among Alumni and in industry throughout the country as the Institute's placement officer, has been appointed director of Technology's Division of Industrial Cooperation. Acting head of the Division since the death last September of Professor Charles L. Norton, '93, he will continue as placement officer.

The Division of Industrial Cooperation came into existence in 1920 under the direction of William H. Walker, Professor of Chemical Engineering, who resigned the same year and was succeeded by Professor Norton. Under the latter's guidance, the activities of the Institute in fulfillment of its charter obligations to aid industry were centralized, and the scope and value of this assistance were greatly enhanced by efficient use of the research staff and laboratory facilities.

The primary purpose of all research projects conducted by the Division is the advancement of the educational program of the Institute, which is benefited by developments in industry through participation of the staff in advancing important research. Industry brings to Technology types of research for which the Institute has unique facilities of personnel and equipment. It is not the function of the Division to carry out routine engineering tests. In addition to co-operation with industry, the Institute has a special obligation to assist in



M.I.T. Photo

Nathaniel McL. Sage, '13, Director of the Division of Industrial Cooperation

the solution of problems affecting the public and has frequently co-operated in special research projects with Massachusetts and Federal organizations.

Mr. Sage, a native of Fort Davis, Texas, is experienced in industrial and business management, having served as production superintendent, sales manager, vice-president, and president in a number of companies in the fields of building construction, shipbuilding, manufacturing, and advertising. Before coming to the Placement Office, he was for two years codirector of the Putney School, Putney, Vt. During the World War he was engaged by the Bethlehem Shipbuilding Corporation to work out methods of production control on their Squantum destroyer program. Later he was superintendent of hull construction at the destroyer plant. The volume production methods applied to destroyer construction at the plant were largely the results of his efforts. He has also held the positions of vice-president in charge of sales of industrial construction and engineering of the Morton C. Tuttle Company, Boston; vice-president in charge of sales and advertising of the Raytheon Manufacturing Company; and president of the Atlas Tack Corporation, Fairhaven, Mass.

### Appointed

THE Alumni Fund Board last month named as first director of the Alumni Fund, Henry B. Kane, '24, who recently joined the administrative staff of the

Institute to assist in alumni and public relations activities. In his duties as an officer of the Institute and of the Alumni Association, Mr. Kane will devote full time to the co-ordination of activities relative to supplementary contributions in support of the Institute.

A native of Cambridge, Mr. Kane was graduated from Phillips Exeter Academy in 1920. He then entered the Institute, being graduated from the Course in General Engineering. As an undergraduate he was art editor of *Voo Doo* and a member of its executive committee. He is a member of Theta Chi Fraternity and a number of honorary societies. An active Alumnus, he is vice-president of his Class and was vice-chairman of last year's Alumni Day committee.

Mr. Kane came to his new position at the Institute from the Boston Edison Company, where he had wide experience in illuminating engineering, advertising, and power sales. He is a former editor of the *Journal* of the Engineering Societies of New England. Aside from his professional activities, Mr. Kane is widely known as an illustrator; examples of his work have frequently appeared in *The Review*. He is the author and illustrator of books for children and is an expert nature photographer.

### Modern Pioneers

HIS furthering of fundamental knowledge in electrical engineering brought to William D. Coolidge, '96, director of the research laboratory of the General Electric Company, recognition as one of the group of national Modern Pioneers whose accomplishments were recently signalized by the National Association of Manufacturers. The national Modern Pioneers committee of the association included Frank W. Lovejoy, '94, Alfred P. Sloan, Jr., '95, Lamot du Pont, '01, Frank B. Jewett, '03, and Martin H. Eisenhart, '07. Conferring of the awards celebrated the 150th anniversary of the United States patent system and honored chief inventors and research scientists who have notably shared in discovering and putting new knowledge to productive use. From over a thousand inventors and scientists nominated after a nation-wide survey, an awards committee, of which President Compton served as chairman, selected 572 for recognition by the association. Nineteen particularly noteworthy nominees were recommended for national awards.

Alumni among the larger group included three members of the Institute's Faculty: Alfred V. de Forest, '11, Professor of Mechanical Engineering, honored for his methods of nondestructive testing of materials; Arthur C. Hardy, '18, Professor of Optics and Photography, for inventions in talking moving pictures, color measurement, and color photography; and Harold E. Edgerton, '27, Associate Professor of Electrical Measurements, for his development of the use of stroboscopic light in photography and measurement. Other Alumni receiving awards in the Boston area were Henry E. Warren, '94, President, Warren Telechron Company, Ashland, Mass., for his invention of a way of so regulating electric impulses sent over electric circuits as to keep electric clocks in perfect step; Edwin M. Lines, '05, director of research, Bird and Son, Inc., East Walpole, Mass., for work in the perfecting of a process of making a new mono-



Henry B. Kane, '24, first Director of the newly established Alumni Fund

lithic patterned floor covering; and Franklin A. Reece, '13, President, Reece Buttonhole Machine Company, Boston, for development of a textile roll without reciprocating parts.

In the Baltimore area, award was made to Frederick H. Untiedt, '22, patent lawyer, for his invention of means of aerating rubber latex to a foamy mass for use in mattresses, cushions, and similar objects. Joseph Harrington, '96, President, Harrington Heater Company, Riverside, Ill., received an award in the Chicago area for inventions and development work instrumental in increasing the efficiency of combustion in furnaces and power plants. In this area, also, John M. Frank, '07, President, Ilg Electric Ventilating Company, was honored for his invention of the steam unit heater.

Hayden B. Kline, '24, Vice-President in Charge of Plant Operations, Industrial Rayon Corporation, Cleveland, Ohio, for perfection of a continuous-spinning process (see photograph on page 226) for the manufacture of rayon yarn, was recipient of an award in the Cleveland area, where Bengt R. F. Kjellgren, '24, and Charles B. Sawyer, '17, of the Brush Laboratories Company — Mr. Kjellgren being vice-president — shared in a joint award. In Detroit, Willard F. Rockwell, '08, President, Timken-Detroit Axle Company, was named a Modern Pioneer in recognition of inventions dominant in the heavy-duty truck axle industry and inventions of regulating and metering instruments. The Hartford, Conn., area saw Karl E. Peiler, '04,





George H. Darts

*This portrait of Charles A. Stone, '88, and Edwin S. Webster, '88, whose association in the firm which bears their names began half a century ago, was recently unveiled. Painted by Margaret Fitzhugh Browne, it is a gift from the late Mr. and Mrs. Henry A. Wise Wood and, with portraits of Arthur D. Little, '85, and Samuel F. B. Morse, completes a series which Mr. and Mrs. Wood presented to the Institute.*

Vice-President and research engineer, Hartford-Empire Company, honored for his many inventions having to do with handling molten glass and with manufacturing glassware; and Frank W. Caldwell, '12, engineering manager, Hamilton Standard Propellers division, United Aircraft Corporation, East Hartford, for patents on the controllable-pitch propeller, known popularly as the gearshift of the air.

The Class of 1904 was represented on the West Coast through award to Herbert T. Kalmus, President, Technicolor Motion Picture Corporation, Hollywood, Calif., for his development of Technicolor motion pictures.

Willis R. Whitney, '90, Vice-President in Charge of Research, General Electric Company, was honored in the New York area as a pioneer in establishing the modern type of industrial research laboratory. Carleton Ellis, '00, consultant, Standard Oil Development Company, signalized as the most prolific living inventor, having had 738 United States patents granted him, received a New York award on the basis of his work in the petroleum industry, where the most widely used cracking process is one invented by him. To Richard H. Ranger, '11, President, Rangertone, Inc., Newark, N. J., award was made for his work in the transmission of pictures by radio and in the development of electrical musical devices. Robert E. Wilson, '16, President, Pan American Petroleum and Transport Company, New York City, was honored for work in the conservation of hydrocarbon vapors, permitting extensive economic savings in the petroleum industry (see page 232). Three Alumni who are members of the technical staff of the Bell Telephone Laboratories received awards in the New York area: Burton W. Kendall, '06, for patents of basic importance in multiplex carrier current transmission; Herman A. Affel, '14, for basic telephonic inventions, particularly concerning automatic gain control at repeater stations; and Edward C. Wentz, '14, for the invention of the condenser microphone and of loud-speaker equipment of comparable quality. Earle C. Pitman, '16, chemist, E. I. du Pont de Nemours and Company, Inc., Wilmington, Del., received an award in the New York area for his share in the development of lacquer finishes.

In the Philadelphia area, Richard G. Woodbridge, Jr., '07, and Mr. Pitman were named together in another joint award, and Mr. Woodbridge, a chemist with the Du Pont firm, was again named for his share in the manufacture of an improved rifle powder. Philip H. Chase, '09, chief engineer, Philadelphia Electric Company, was honored for improvements in insulation and cables, contributing to the better transmission of current. Herbert O. Albrecht, '22, chemist with the Du Pont firm, shared in an award for the development of baking and air-dried enamels based on alkyd resins. Forest J. Funk, '15, John L. Keats, '20, and Chaplin Tyler, '23, chemists of the Du Pont organization, received honorable mention in the Philadelphia area.

Two awards in the Rochester area came to Technology men. William C. Taylor, '08, chief chemist, Corning Glass Works, Corning, N. Y., was honored for his patents on Pyrex glass and for patents on a glass of low coefficient of expansion; and Raymond R. Ridgway, '20, director of abrasive research, Norton Company, Niagara Falls, N. Y., for his work on the utilization of boron carbide as an abrasive. J. Frederic Walker, '25, of the Du Pont organization's Niagara Falls unit, received honorable mention in this area.

Edwin S. Pillsbury, '89, President, Century Electric Company, St. Louis, Mo., for his development of a commercially practical single-phase motor, received an award in the St. Louis area. William P. Bentley, '04, President, Uvalde Construction Company, Dallas, Texas, was honored in the St. Louis area for his devising of ways of producing bituminous paving mixtures.

### *Alice Maclaurin Room*

THE gracious and inspiring work of Mrs. Richard C. Maclaurin in her association with wives of members of the staff during Dr. Maclaurin's administration has been given recognition in the naming of a room which, with the Emma Rogers Room, is provided by the Institute for meetings and social events of the Technology Matrons, the Technology Dames, and the Technology Women's Association. Leaders of the three organizations, which are composed, respectively, of wives of the staff, of wives of the students, and of Alumnae of Technology, recently dedicated the Alice Maclaurin Room, an attractive lounge which was formerly the Margaret Cheney Room and was until recently occupied by women students, whose new quarters memorialize Miss Cheney, '82. The guests at the dedication included Mrs. Maclaurin, Dr. and Mrs. Compton, eleven of twenty-two former chairmen of (Concluded on page 258)

## SCIENCE AND LINGUISTICS

*(Continued from page 231)*

thrown in for good measure. Among these tongues there is a unanimity of major pattern which at first seems to bear out natural logic. But this unanimity exists only because these tongues are all Indo-European dialects cut to the same basic plan, being historically transmitted from what was long ago one speech community; because the modern dialects have long shared in building up a common culture; and because much of this culture, on the more intellectual side, is derived from the linguistic backgrounds of Latin and Greek. Thus this group of languages satisfies the special case of the clause beginning "unless" in the statement of the linguistic relativity principle at the end of the preceding paragraph. From this condition follows the unanimity of description of the world in the community of modern scientists. But it must be emphasized that "all modern Indo-European-speaking observers" is not the same thing as "all observers." That modern Chinese or Turkish scientists describe the world in the same terms as Western scientists means, of course, only that they have taken over bodily the entire Western system of rationalizations, not that they have corroborated that system from their native posts of observation.

When Semitic, Chinese, Tibetan, or African languages are contrasted with our own, the divergence in analysis of the world becomes more apparent; and when we bring in the native languages of the Americas, where speech communities for many millenniums have gone their ways independently of each other and of the Old World, the fact that languages dissect nature in many different ways becomes patent. The relativity of all conceptual systems, ours included, and their dependence upon language stand revealed. That American Indians speaking only their native tongues are never called upon to act as scientific observers is in no wise to the point. To exclude the evidence which their languages offer as to what the human mind can do is like expecting botanists to study nothing but food plants and hothouse roses and then tell us what the plant world is like!

Let us consider a few examples. In English we divide most of our words into two classes, which have different grammatical and logical properties. Class 1 we call nouns, e.g., "house," "man"; Class 2, verbs, e.g., "hit," "run." Many words of one class can act secondarily as of the other class, e.g., "a hit," "a run," or "to man" the boat, but on the primary level the division between the classes is absolute. Our language thus gives us a bipolar division of nature. But nature herself is not thus polarized. If it be said that strike, turn, run, are verbs because they denote temporary or short-lasting events, i.e., actions, why then is fist a noun? It also is a temporary event. Why are lightning, spark, wave, eddy, pulsation, flame, storm, phase, cycle, spasm, noise, emotion, nouns? They are temporary events. If man and house are nouns because they are long-lasting and stable events, i.e., things, what then are keep, adhere, extend, project, continue, persist, grow, dwell, and so on, doing among the verbs? If it be objected that possess, adhere, are verbs because they are stable relationships rather than stable percepts, why then should equilibrium,

pressure, current, peace, group, nation, society, tribe, sister, or any kinship term, be among the nouns? It will be found that an "event" to us means "what our language classes as a verb" or something analogized therefrom. And it will be found that it is not possible to define event, thing, object, relationship, and so on, from nature, but that to define them always involves a circuitous return to the grammatical categories of the definer's language.

In the Hopi language, lightning, wave, flame, meteor, puff of smoke, pulsation, are verbs — events of necessarily brief duration cannot be anything but verbs. Cloud and storm are at about the lower limit of duration for nouns. Hopi, you see, actually has a classification of events (or linguistic isolates) by duration type, something strange to our modes of thought. On the other hand, in Nootka, a language of Vancouver Island, all words seem to us to be verbs, but really there are no Classes 1 and 2; we have, as it were, a monistic view of nature that gives us only one class of word for all kinds of events. "A house occurs" or "it houses" is the way of saying "house," exactly like "a flame occurs" or "it burns." These terms seem to us like verbs because they are inflected for durational and temporal nuances, so that the suffixes of the word for house event make it mean long-lasting house, temporary house, future house, house that used to be, what started out to be a house, and so on.

Hopi has a noun that covers every thing or being that flies, with the exception of birds, which class is denoted by another noun. The former noun may be said to denote the class (FC-B) — flying class minus bird. The Hopi actually call insect, airplane, and aviator all by the same word, and feel no difficulty about it. The situation, of course, decides any possible confusion among very disparate members of a broad linguistic class, such as this class (FC-B). This class seems to us too large and inclusive, but so would our class "snow" to an Eskimo. We have the same word for falling snow, snow on the ground, snow packed hard like ice, slushy snow, wind-driven flying snow — whatever the situation may be. To an Eskimo, this all-inclusive word would be almost unthinkable; he would say that falling snow, slushy snow, and so on, are sensuously and operationally different, different things to contend with; he uses different words for them and for other kinds of snow. The Aztecs go even farther than we in the opposite direction, with cold, ice, and snow all represented by the same basic word with different terminations; ice is the noun form; cold, the adjectival form; and for snow, "ice mist."

What surprises most is to find that various grand generalizations of the Western world, such as time, velocity, and matter, are not essential to the construction of a consistent picture of the universe. The psychic experiences that we class under these headings are, of course, not destroyed; rather, categories derived from other kinds of experiences take over the rulership of the cosmology and seem to function just as well. Hopi may be called a timeless language. It recognizes psychological time, which is much like Bergson's "duration," but this "time" is quite unlike the mathematical time, *T*, used by our physicists. Among the peculiar properties of Hopi time are that it varies with (*Concluded on page 248*)



## SCIENCE AND LINGUISTICS

*(Concluded from page 247)*

each observer, does not permit of simultaneity, and has zero dimensions, i.e., it cannot be given a number greater than one. The Hopi do not say, "I stayed five days," but "I left on the fifth day." A word referring to this kind of time, like the word day, can have no plural. The puzzle picture (Fig. 3, page 231) will give mental exercise to anyone who would like to figure out how the Hopi verb gets along without tenses. Actually, the only practical use of our tenses, in one-verb sentences, is to distinguish among five typical situations, which are symbolized in the picture. The timeless Hopi verb does not distinguish between the present, past, and future of the event itself but must always indicate what type of validity the *speaker* intends the statement to have: (a) report of an event (situations 1, 2, 3 in the picture); (b) expectation of an event (situation 4); (c) generalization or law about events (situation 5). Situation 1, where the speaker and listener are in contact with the same objective field, is divided by our language into the two conditions, 1a and 1b, which it calls present and past, respectively. This division is unnecessary for a language which assures one that the statement is a report.

Hopi grammar, by means of its forms called aspects and modes, also makes it easy to distinguish between momentary, continued, and repeated occurrences, and to indicate the actual sequence of reported events. Thus the universe can be described without recourse to a concept of dimensional time. How would a physics constructed along these lines work, with no *T* (time) in its equations? Perfectly, as far as I can see, though of course it would require different ideology and perhaps different mathematics. Of course *V* (velocity) would have to go too. The Hopi language has no word really equivalent to our "speed" or "rapid." What translates these terms is usually a word meaning intense or very, accompanying any verb of motion. Here is a clue to the nature of our new physics. We may have to introduce a new term *I*, intensity. Every thing and event will have an *I*, whether we regard the thing or event as moving or as just enduring or being. Perhaps the *I* of an electric charge will turn out to be its voltage, or potential. We shall use clocks to measure some intensities, or, rather, some *relative* intensities, for the absolute intensity of anything will be meaningless. Our old friend acceleration will still be there but doubtless under a new name. We shall perhaps call it *V*, meaning not velocity but variation. Perhaps all growths and accumulations will be regarded as *V*'s. We should not have the concept of rate in the temporal sense, since, like velocity, rate introduces a mathematical and linguistic time. Of course we know that all measurements are ratios, but the measurements of intensities made by comparison with the standard intensity of a clock or a planet we do not treat as ratios, any more than we so treat a distance made by comparison with a yardstick.

A scientist from another culture that used time and velocity would have great difficulty in getting us to understand these concepts. We should talk about the intensity of a chemical reaction; he would speak of its velocity or its rate, which words we should at first think

were simply words for intensity in his language. Likewise, he at first would think that intensity was simply our own word for velocity. At first we should agree, later we should begin to disagree, and it might dawn upon both sides that different systems of rationalization were being used. He would find it very hard to make us understand what he really meant by velocity of a chemical reaction. We should have no words that would fit. He would try to explain it by likening it to a running horse, to the difference between a good horse and a lazy horse. We should try to show him, with a superior laugh, that his analogy also was a matter of different intensities, aside from which there was little similarity between a horse and a chemical reaction in a beaker. We should point out that a running horse is moving relative to the ground, whereas the material in the beaker is at rest.

One significant contribution to science from the linguistic point of view may be the greater development of our sense of perspective. We shall no longer be able to see a few recent dialects of the Indo-European family, and the rationalizing techniques elaborated from their patterns, as the apex of the evolution of the human mind; nor their present wide spread as due to any survival from fitness or to anything but a few events of history — events that could be called fortunate only from the parochial point of view of the favored parties. They, and our own thought processes with them, can no longer be envisioned as spanning the gamut of reason and knowledge but only as one constellation in a galactic expanse. A fair realization of the incredible degree of diversity of linguistic system that ranges over the globe leaves one with an inescapable feeling that the human spirit is inconceivably old; that the few thousand years of history covered by our written records are no more than the thickness of a pencil mark on the scale that measures our past experience on this planet; that the events of these recent millennia spell nothing in any evolutionary wise, that the race has taken no sudden spurt, achieved no commanding synthesis during recent millennia, but has only played a little with a few of the linguistic formulations and views of nature bequeathed from an inexpressibly longer past. Yet neither this feeling nor the sense of precarious dependence of all we know upon linguistic tools which themselves are largely unknown need be discouraging to science but should, rather, foster that humility which accompanies the true scientific spirit, and thus forbid that arrogance of the mind which hinders real scientific curiosity and detachment.

## FROM HAZARD TO HARVEST

*(Continued from page 234)*

with half a molecule of oxygen to form one molecule of carbon monoxide and two molecules of hydrogen. This gaseous mixture can then be converted into a series of straight-chain olefins boiling mainly in the gasoline range. Unfortunately, these hydrocarbons knock so badly that they do not make satisfactory motor fuel without further chemical change, but they do furnish a cheap source of straight-chain olefins between  $C_5$  and, say,  $C_{12}$  which can be readily separated for chemical purposes or hydrogenated to *(Continued on page 250)*

Arthur D. Little, Inc. welcomes every opportunity to consider matters of research policy, as well as specific research problems. Extensive and diversified research experience obtained over a long period and in coöperation with many successful industries can be drawn upon for the analysis and clarification of general policy, and suggestions for procedure to be followed.

**Arthur D. Little, Inc.**

Charles River Road at Kendall Square

Cambridge, Massachusetts



## FROM HAZARD TO HARVEST

*(Continued from page 248)*

paraffins for various special uses in which a highly paraffinic naphtha is desirable. While these synthetic processes are of great importance to the chemical industry, they are not so important to the petroleum industry, because the total amount of refinery gases is hundreds of times as large as the chemical industry is likely to need for some time to come. Far more important to the petroleum industry are certain new processes, usually involving polymerization, whereby a large part of the refinery gases can be converted into gasoline of unusually high quality. In a sense these processes are the reverse of cracking, as they cause the relatively small gas molecules to recombine into medium-sized molecules suitable for gasoline. Polymerizing gas back into gasoline is the industry's briquetting process.

Commercial polymerization processes applied to cracked gases are of two general types: catalytic processes which polymerize mainly the propylene and butylenes into higher olefins, generally with phosphoric acid as a catalyst at temperatures between 400 degrees and 500 degrees Fahrenheit; and thermal polymerization processes which crack the saturated hydrocarbons and polymerize the increased quantities of olefins at much higher temperatures and pressures. Since the demand for these polymer gasolines (of around 85 octane) is almost unlimited, such processes will doubtless be adopted rather generally; in fact, about six hundred thousand gallons of such gasoline are being synthesized daily by polymerization plants already operating in the country.

Possibly even more important from the standpoint of our national welfare are a series of new processes which separate out certain relatively pure hydrocarbons from the refinery gases and cause them to combine to make certain special hydrocarbons of a composition especially suited for use in aviation gasoline. Airplane engines are able to profit by such superantiknock fuels (95 to 100 octane) in several ways, all resulting from the basic fact that the higher the octane rating of the gasoline, the higher the compression ratio that can be employed in the engine and the better its efficiency and power output. High-octane gasoline in aviation accordingly means a smaller load of fuel, a lower engine weight per unit power output, and lower head resistance, not only because the engines are smaller but also because the conversion of more of the fuel into power reduces the amount of waste heat that must be dissipated through the cooling system. Since all these factors increase the useful load and improve the general performance of aircraft, the value of these new high-octane aviation fuels for either military or commercial aviation is several times the value of ordinary aviation gasoline. This fact has naturally led to a great deal of research for making these synthetic blending stocks of around 100 octane number, especially since iso-octane and other highly branched saturated hydrocarbons in this range are the best-known compounds for use in aviation fuels. The corresponding olefins have similar octane numbers for automotive use, but they lose much of their antiknock value at the high temperatures which prevail in aviation

engines. The high-octane synthetic fuels are usually blended with ordinary aviation stocks and tetraethyl lead to make commercial 100 octane aviation gasoline.

The first processes for making these high-octane blending stocks took advantage of the fact that isobutylene polymerized more readily than any of the other gaseous hydrocarbons, and accordingly a  $C_4$  cut could be polymerized either with 70 per cent sulphuric acid at ordinary temperatures or with phosphoric acid at moderately elevated temperatures to form di-isobutylene. This in turn could readily be hydrogenated to form fairly pure iso-octane. Later it was found that by the use of similar acid at temperatures around 175 degrees Fahrenheit, a copolymer of isobutylene and butylene could be formed. This process gives about twice as much polymer which can be hydrogenated to yield an almost equally good aviation fuel. Both of these two-step processes are being largely superseded by a process known as alkylation, which makes saturated hydrocarbons by the direct addition of the butylenes to isobutane and thus avoids the hydrogenation step. Isobutane, on account of its tertiary carbon atom, is the only hydrocarbon in refinery gas that will enter into this reaction, which takes place in the presence of strong sulphuric acid at moderate temperatures, provided the isobutane concentration is kept much higher than that of the olefins. This quality again practically doubles the yield of aviation gasoline obtainable from a given quantity of gas because it adds one saturated molecule to each unsaturated molecule. This gain in yield is partially offset by the fact that the octane number of the product is only about 95.

Propylene can also be made to react with isobutane and give a heptane of excellent antiknock and somewhat greater volatility. Ethylene does not react so readily but can be made to react either by the use of promoted acid or other catalysts, or by heating isobutane under very high pressures and bleeding in small amounts of ethylene.

All of these alkylation processes must use isobutane, the quantity of which is limited. This difficulty can readily be overcome by the fact that normal butane, which is abundantly available, can be isomerized into isobutane by contact with aluminum chloride or a similar catalyst. While the need for isobutane has not as yet forced recourse to this conversion, its availability, plus known processes for the dehydrogenation of propane and butane, means that practically the entire  $C_3$  and  $C_4$  cuts of refinery gases can easily be made available for the production of very high-octane aviation gasoline. These processes, together with the fact that we produce far more refinery gases than do all other countries put together, place this country in a highly advantageous position from the standpoint of both military and commercial aviation. Present installed capacity is around five hundred thousand gallons a day of these high-octane blending stocks and is being augmented rapidly.

Isobutylene is particularly interesting as a special example of the possibilities of polymerization. Under different conditions and with different catalysts, it can be polymerized to iso-octene, yielding high antiknock gasoline; high-quality lubricating oil; very viscous addition agents for lubricating oils (*Continued on page 252*)

ESTABLISHED 1818

# Brooks Brothers,

## CLOTHING,

### Mens Furnishings, Hats & Shoes

MADISON AVENUE COR. FORTY-FOURTH STREET  
NEW YORK

#### WIDE CHOICE . . . ONE STANDARD

For many generations, Brooks Brothers have imported outstandingly fine woollens from England, Scotland and Ireland. Long-time relationships have been maintained with many famous British mills. Thus our choice (a choice which eventually becomes your choice) of patterns, colors and weaves in imported materials, supplemented, as occasion arises, by fine domestic woollens, is a wide one. Wide as it is, there is only one standard of good taste — a standard known and respected by the world's finest woollen makers as well as by our customers, whom we are pleased to regard as the world's most exacting: Brooks Standard

#### BRANCHES

NEW YORK: ONE WALL STREET  
BOSTON: NEWBURY COR. BERKELEY STREET



## MASSACHUSETTS INSTITUTE OF TECHNOLOGY

*Cambridge, Massachusetts*

THE schools of Architecture, Engineering and Science, the Graduate School and the Division of Humanities offer instruction and opportunities for research, both undergraduate and graduate, in the following fields of study as well as in allied subjects:

#### SCHOOL OF ARCHITECTURE

Architecture  
City Planning  
City Planning Practice

#### SCHOOL OF SCIENCE

Biology and Public Health  
Chemistry  
General Science  
Geology  
Mathematics  
Physics

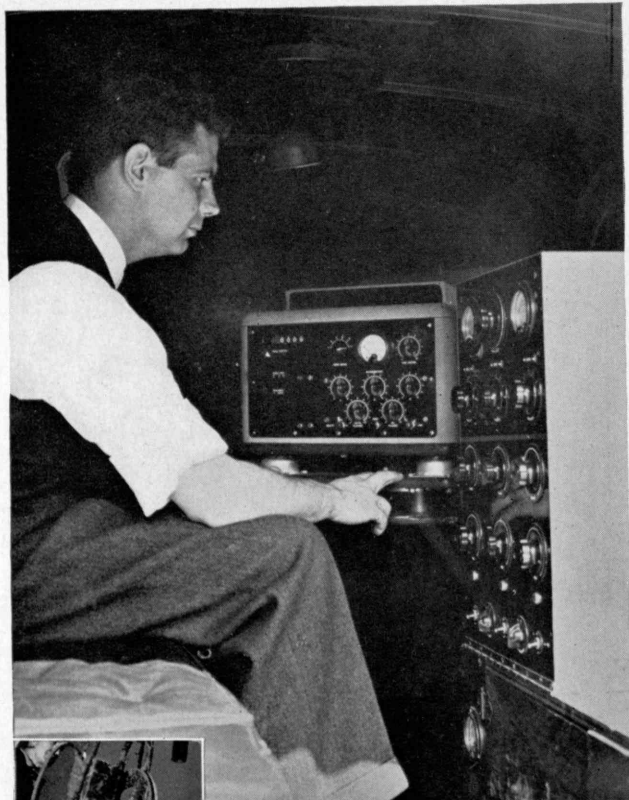
#### SCHOOL OF ENGINEERING

Aeronautical Engineering  
Building Engineering and Construction  
Business and Engineering Administration  
Chemical Engineering  
Civil and Sanitary Engineering  
Electrical Engineering  
General Engineering  
Marine Transportation  
Mechanical Engineering  
Metallurgy  
Naval Architecture and Marine Engineering

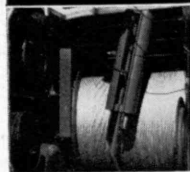
The Catalogue contains full information and will be sent gratis and post free upon request. All correspondence regarding admission either to undergraduate or graduate study should be addressed to the Director of Admissions, M.I.T., Cambridge, Mass.



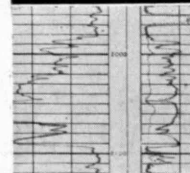
## GETTING DOWN TO FACTS IN THE OIL FIELDS—



Calibrated sheave wheels accurately measure cable in and out of the hole.



15,000 feet of five-conductor cable enables Electrolog to reach the bottom of any hole drilled.



Electrolog Multicurve Records show Natural Potential, Shallow and Deep Resistivity of all formations.

### LANE-WELLS *Electrolog* ACCURATELY RECORDS SURFACE FORMATIONS

Drilling oil wells is an expensive business—one that may be disastrously expensive if the petroleum engineer is not certain of what lies below the derrick foundation. Getting facts about the nature of bore-hole formations is a Service developed by Lane-Wells engineers that saves oil well operators many times its cost by accurately logging both productive and non-productive sands.

For engineering students interested in the development of Technical Oil Field Services, Lane-Wells has prepared Bulletins on Electrolog, Gun Perforating, and Oil Well surveys. A copy will be sent without cost. Write today.

**LANE-WELLS**  
COMPANY  
LOS ANGELES      HOUSTON      OKLAHOMA CITY      NEW YORK

## FROM HAZARD TO HARVEST

(Continued from page 250)

to improve their viscosity characteristics and inhibit wax crystallization; and hard brittle resins, which have certain special uses. By proper control of the polymerization of this one compound, it is possible to synthesize high-quality substitutes for almost all ordinary petroleum products, and to go even to products with molecular weights as high as 400,000.

The probable cost of these various hydrocarbons at different locations is difficult to determine because it naturally varies greatly from point to point and is now in the process of flux. In view of the importance of the subject to the chemical industry, however, an individual estimate of the situation may be of some value.

While it is possible to separate out narrow cuts or individual compounds from refinery gas for shipment to chemical plants, usually the freight costs are so high that it is better for a chemical plant intending to use large quantities of these hydrocarbons to be located at a refinery, where both the fuel and raw-material costs are at a minimum and where unused tail gases and other by-products can generally be returned to the refinery as a credit against raw-material cost. Of course, evaluations must reckon with the fact that an important chemical plant should be located only in connection with a large and reasonably permanent refinery; in general, such refineries either are, or soon will be, equipped with some type of polymerization process.

A rough idea of the relative value of a given hydrocarbon can be obtained by reference to Fig. 1 (page 232). Methane, in the upper left, is the most plentiful and the cheapest of all the hydrocarbons, and the value of the hydrocarbons in general increases steadily as one moves down the table or to the right, with isobutene probably the most reactive and valuable compound.

Methane, ethane, and ethene are normally worth only fuel value at a typical refinery, which means from four cents to twelve cents per million British thermal units, depending upon refinery location. Methane, with some ethane, is of course available at almost nominal cost in natural-gas fields which are remote from pipe lines, and the effective chemical utilization of this compound on a large scale is the pot of gold at the end of the rainbow of much research, though it must be remembered that methane has much lower free energy than have any of the higher hydrocarbons. Propane has a value somewhat greater than fuel value because it can be cracked or dehydrogenated to propene and then polymerized into gasoline, but very large quantities are still available in natural-gasoline plants. Propene, of course, occupies an intermediate position between propane and the butenes, as it can be readily polymerized.

For reasons already set forth, all the butanes and butylenes would be worth close to gasoline value if refineries were effectively isolated by distance, or otherwise, from cheap casing-head gasoline, but since all casing-head plants have an excess of butane and isobutane, the value of the C<sub>4</sub> cut in most refineries tends to be limited. The relative value of butane and isobutane also depends on local conditions — butane is more desirable for incorporation in gasoline, as (Concluded on page 253)



**DOMINANT** *Point-of-Sale*

**BUSINESS BUILDERS**

**FOR 3 INDUSTRIES**

... Let us help you  
**LIGHT CONDITION YOUR HOME**



**TAKE HOME  
SOME BULBS**

**We Recommend:**

**150 WATT**

for  
KITCHEN, LAUNDRY  
WORKSHOP AND  
INDIRECT CEILING  
FIXTURES

**20¢**

**100 WATT**

for  
KITCHENETTES,  
LAUNDRY WORKSHOP  
1-SOCKET TABLE AND  
FLOOR LAMPS AND  
SOCKET FIXTURES

**15¢**

**60 WATT**

for  
2-SOCKET FLOOR  
AND TABLE LAMPS  
AND BATHROOM  
MIRROR LIGHTS

**15¢**

**BETTER LIGHT for BETTER S...**

**ELECTRICAL  
EQUIPMENT**

**DRUGS AND  
COSMETICS**

**Pacquins**  
HAND CREAM

*for lovely  
youthful hands*



**SO GOOD**

**CANDY AND FOOD  
PRODUCTS**

**CREATED & PRODUCED BY**

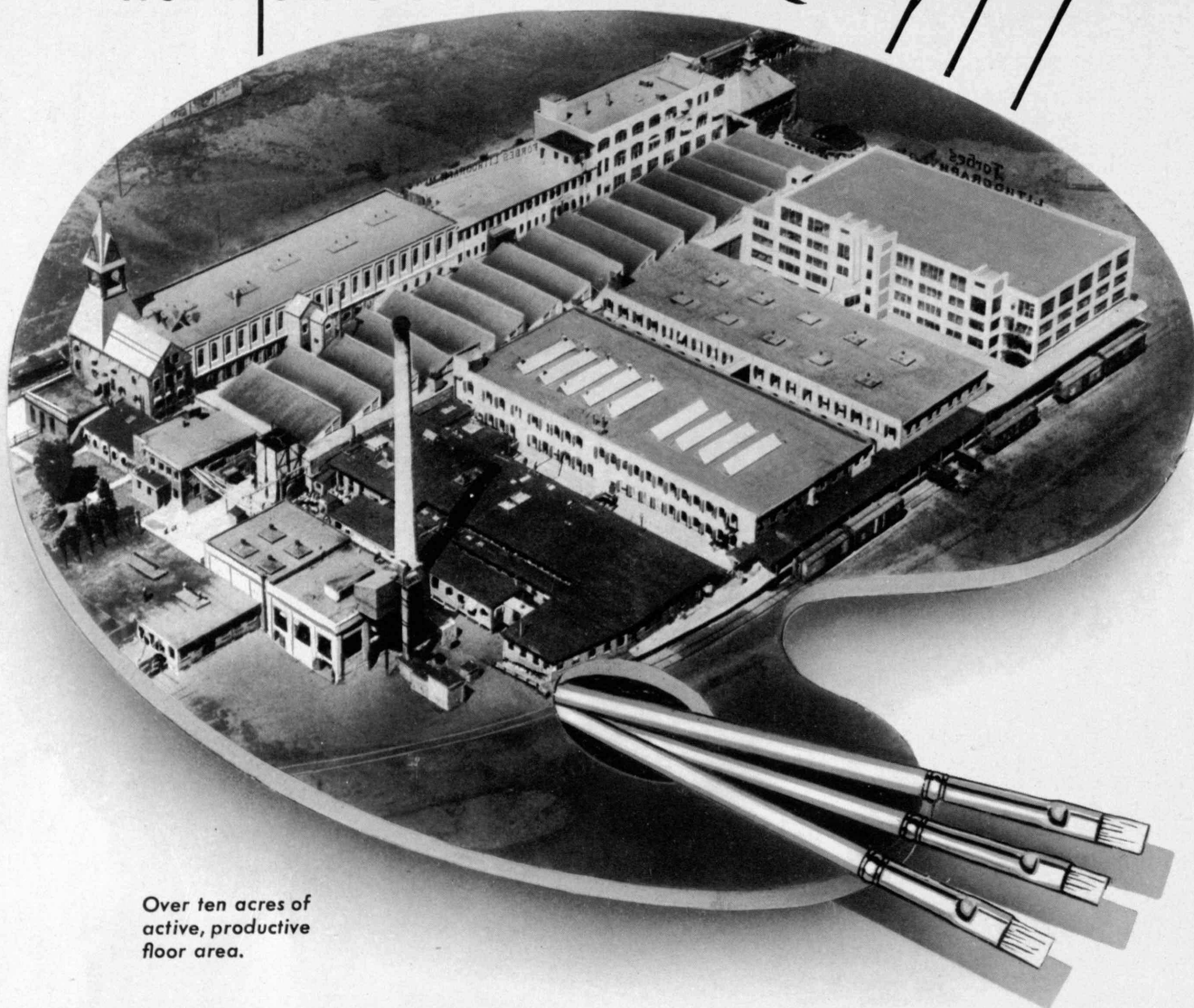
**FORBES**

© THIS INSERT IS LITHOGRAPHED

WILLIAM S. FORBES, CLASS OF '93



# Headquarters For *Creative Lithography*



Over ten acres of  
active, productive  
floor area.

*Products of* FORBES creative ingenuity, stemming from sound merchandising judgment, and an understanding of buying habits.

DISPLAYS and POSTERS  
COUNTER MERCHANDISERS  
CARTONS, LABELS, WRAPPERS  
PRINTED CELLOPHANE

PACKAGE INSERTS  
BOOKLETS and FOLDERS  
CALENDARS and ART PLATES  
BUSINESS STATIONERY

Produced by craftsmen — on precision equipment . . . in this modern lithographing and printing plant . . . noted for quality production.

# FORBES



# LITHOGRAPH CO.

P. O. BOX 513 • BOSTON

NEW YORK

CHICAGO

CLEVELAND

ROCHESTER

DETROIT

WILLIAM S. FORBES, CLASS OF '93

## FROM HAZARD TO HARVEST

(Concluded from page 252)

it has a lower vapor pressure than has isobutane; on the other hand, isobutane is particularly valuable for utilization in the alkylation processes.

Surely neither the petroleum industry nor the chemical industry has any more remarkable chapter than that of the last twenty years, during which refinery gas has gone from a neglected waste product to an invaluable raw material for hundreds of chemical compounds and for the most important fuels now being made for both automobile and aviation engines. Furthermore, there is every reason to believe that the next twenty years will see further developments of equal or greater importance.

## HOW EFFICIENT IS THE STATE?

(Continued from page 236)

In respect to their prescribed qualifications, legislators are regarded as alternates for the individual citizens and not as technical experts of superior or specialized competency.

So here is a social lag: We begin with a situation in which the legislative instrument is adapted to the solution of the pending problems; these problems become more varied and more complex; but the instrument does not keep pace in its development — it lags behind.

The closing of this lag is greatly to be desired, because the legislative process is the heart of democratic government. Unless the legislative process can in some way be made more efficient, democracy itself will be threatened. It would be a mistake to assume that the representative parliaments of a number of European states have been abolished merely because dictators wished to dictate. Their suppression occurred in large part because of strains toward greater national efficiency under the pressures of postwar socioeconomic problems. These strains are operative at present in the United States. The problem here posed for democracy, then, is whether ways can be found to maintain an ultimate citizen control over the legislative process while entrusting the actual process to persons of special competence in respect to the immediate issues requiring legislation.

I cannot predict the eventual answer to this problem, but I believe that numerous innovations out of which solutions may grow are visible. Legislative bill-drafting services are an instance. *Ad hoc* legislative committees whose work is guided by legal and technical counsel are another. Much attention is now being directed in Washington to a proposal to equip the appropriating committees of Congress with staffs of expert examiners to study in the field the very large number of administrative activities for which appropriations are made.

Meanwhile, the past and continued inadaptation of legislative bodies has weakened them, as shown by the development of legislative functions in the executive and judicial branches of government. Municipal councils have long been undergoing "reform." Many have been translated into such semiexecutive agencies as commission-form governments. (Continued on page 254)



## Hevi Duty Electric Co.

### Electric Furnaces

MILWAUKEE, WISCONSIN

Hevi Duty Precision Electric Heat Treating Furnaces are built in a large variety of types and sizes — for many heat treating operations — with temperature ranges to 2350° F. (1287° C.). They are standard production equipment in many national industrial plants.

Write for descriptive bulletins

GEORGE A. CHUTTER, '21  
District Manager  
90 West Broadway, Room 79  
New York

ELTON E. STAPLES, '26  
District Manager  
205 W. Wacker Drive  
Chicago, Ill.

TECHNOLOGY MEN . . .

## Walker Memorial

### Technology's Social Center

is the

HOME FOR YOUR  
CLASS FUNCTIONS

30

MENUS SUBMITTED ON REQUEST

30

Address: A. W. BRIDGES

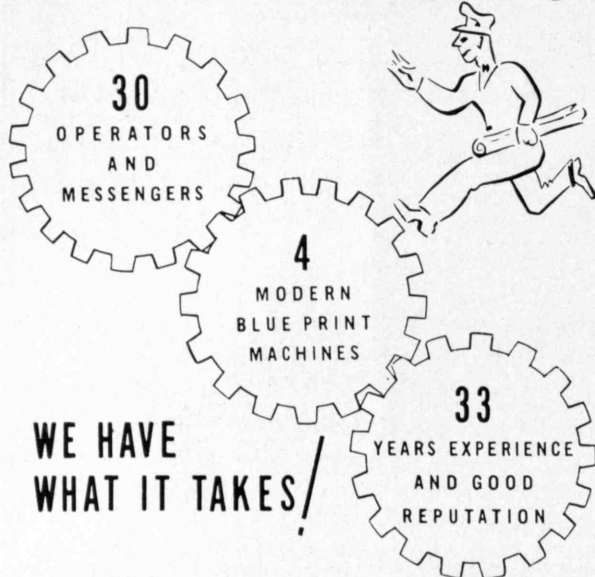
WALKER MEMORIAL DINING SERVICE

M. I. T.

Cambridge, Massachusetts



# BLUE PRINTS



WE HAVE  
WHAT IT TAKES!

## ELECTRO SUN CO.

UPTOWN OFFICE • MURRAY HILL 6-6526-7-8  
Grand Central Terminal Building • 70 East 45th Street, New York City

DOWNTOWN OFFICE • BARCLAY 7-2334-5-6  
161 Washington Street • Near Cortlandt Street, New York City

A. L. Weil '01

**P  
R  
I  
N  
T  
I  
N  
G**

## LETTERPRESS AND OFFSET

Of outstanding quality is produced by us daily for many buyers of good printing. Our forty years experience and modern equipment are available to you in caring for your printing problems

**THE MURRAY  
PRINTING COMPANY**  
KENDALL SQUARE, CAMBRIDGE

## HOW EFFICIENT IS THE STATE?

(Continued from page 253)

At the Federal level, the growing dominance of the executive in the preparation and enactment of legislation has been a subject of continued discussion for several decades at least, as has the frequent legislative effect of judicial decisions. While Congress, for example, has the responsibility for voting appropriations, it created in 1921 the Bureau of the Budget, now administered directly under the President, to formulate executive recommendations to Congress respecting needed appropriations. The authority to recommend, in this instance, seems fully as important as the authority to appropriate.

These trends, in my opinion, are independent of the particular party which may at any time control the administration, and of the economic philosophies held by the judges on the bench. They have been produced by the *strain toward adaptation*, in the interests of efficiency, to which I have so constantly referred.

In the executive branch of the American governmental system the presence of social lags is even more apparent than in the legislative branch. Prominent among these lags is the anachronism of county government. The county, in its approximate present size and with approximately its present functions, was established as a governmental unit at a time when local transportation depended on horse-drawn vehicles over unsurfaced roads. The average citizen was as remote from the average county seat as he is from his state capital today. Yet despite the universal complaint about tax burdens, there has been no general consolidation of county units. Most of them still maintain, expensively and inefficiently, separate courthouses, jails, almshouses, offices, and "services" of many types.

I should hazard the estimate that four hundred to five hundred subdivisions of the forty-eight states could render vastly better service to the public than is given by the more than three thousand counties into which the states are now divided. The savings in cost to the taxpayers, moreover, would be enormous.

The tendency to centralize functions in the Federal government at the expense of state and local governments has long existed and is continuing. A similar tendency exists toward centralization in state governments at the expense of local governments, although this is offset by many gains in authority by the cities at the expense of the states. It is probable that these tendencies result in considerable measure from the *unnecessary* complexity and inefficiency of local government taken as a whole. They also result to a certain degree from the unrealism of state and municipal boundaries in relation to fundamental economic and social patterns. These tendencies, moreover, have not been discriminating, and their indiscriminating continuation should not be encouraged. My conception of the guiding principles to be employed in the reallocation of governmental functions in the interests of democratic efficiency is expressed by three propositions: First, there is great need for an adaptation of local government to modern technology through a simplification of the structure of local government—reduction in number of units and elimination of redundant functions.

Second, there is need for an examination of the adequacy of existing types of governmental units in terms of geographical and functional jurisdiction, with a consideration of possible needs for new types of units. The development of *metropolitan* authorities in the urban area which centers in the city of Boston, the development of interstate authorities around the metropolitan centers of New York and Philadelphia, and the development of interstate and regional authorities in the basins of the Colorado and Tennessee rivers are all indications of this need.

Third, all governmental functions should be centralized only to that degree which will result in the optimum adaptation between the function and the agency which is to exercise it. The burden of proof should fall upon all centralizing proposals. My primary reason for taking this position respecting centralization will be developed later. A sufficient reason will be mentioned here: I believe that, other things equal, people are able to form the best judgments about questions with which they are familiar, namely, those which affect them intimately.

The immediate requirement introduced by my third proposition, then, is the identification of the issues and functions which pertain, by the criterion of adaptation, to each of the existing governmental levels or to new levels that might be brought into being. What, for example, should be the taxing base and the supervisory area of public school administration? Is income taxation an appropriate function of national or state governments? Are state-imposed barriers upon commerce compatible with national welfare? Should there be na-

tional standardization of traffic regulations, of penal codes, of divorce laws, of requirements for medical or legal practice? What functions might more efficiently be attached to regional than to state or national jurisdictions?

Appropriate answers to such questions as these would do much to weld our democratic governmental system as a whole into a smoothly running and more efficient mechanism. They would not by themselves, however, correct what is perhaps the single greatest maladaptation in the present system: I refer to the conception of government as an instrument of coercion, outside the social economy, imposing itself from above, and hence something to be thwarted and restrained within a harness of checks and balances. This conception is warranted today in many nondemocratic nations. It was warranted at a period in our own English-American history when government was an agency of class control. It has survived the conditions which brought it about in this country and is thus another illustration of the social lags which keep our democracy from being a more positive and more efficient instrument of national purpose. The theory of checks and balances in government should be replaced by the determination that government is to be an effective, businesslike instrument for the management of public affairs, responsive to ultimate expressions of social need and public will.

One outcropping of the conception to which I refer has been much in evidence of late. This pertains to the relationships between gov- (Continued on page 256)

## *The Famous \$40* **WORSTED-TEX** *is Still \$40*

At this time with the price of raw wool and woolen fabrics up appreciably, the famous \$40 Worsted-tex remains unchanged as to quality and price. To men who have experienced the pleasure of wearing this particular suit — this announcement is good news. Men who appreciate fine clothes — but have never owned a Worsted-tex — will be interested to know that this nationally famous product has been perfected, over the years, to almost custom standards of fit, fashion, make and the quality of its exclusive worsted fabric.

**\$40**

*Dividend Too*

~~~~~ **THE COOP** HARVARD  
SQUARE ~~~~~



## NORTHEASTERN UNIVERSITY

### SCHOOL of LAW

DAY PROGRAM—Three Years  
EVENING PROGRAM—Four Years

• • •

A minimum of two years of college work required for admission.

A limited number of scholarships available to college graduates.

LL.B. Degree conferred  
Admits men and women

47 MT. VERNON ST., BOSTON  
Near State House



Transits and Levels are used on all largest works and by U. S. Govt. for utmost precision. Rental Insts.

New catalog, just issued, sent gratis

BUFF & BUFF CO. Boston 30, Mass.

L. F. Buff '97—Henry A. Buff '05

A souvenir plumb-bob sent for 3c postage

# Water!

is never  
absorbed by  
**Simplex-ANHYDREX**  
rubber insulation  
for wires and cables

No lead sheath is necessary

## SIMPLEX WIRE & CABLE CO

79 Sidney St., Cambridge, Mass.

## HOW EFFICIENT IS THE STATE?

(Continued from page 255)

ernment and our interknit national economy. It is said that "government interference" with business is a threat to democratic institutions and an evidence of totalitarian tendencies. I suggest, on the contrary (though it would take some time to demonstrate, and experts disagree), that governmental concern with the operations of the economy reflects a strain toward the adaptation of social institutions to science; that it is necessary to the attainment of efficiency in a democracy.

It is paradoxical that those who most freely express fears about governmental interference with the economy are often representatives of groups which have benefited most from this interference. The history of the United States offers little support for an identification of democracy with *laissez faire*. It would be equally correct to identify democracy with governmental interference with the free play of economic forces. Our historical policy has emphasized both private initiative and governmental interference, and our national economy is a resultant of the two in interaction.

A continued extension of governmental interference with the operations of the national economy seems to me inevitable. Should it fail to extend in a hundred and one directions of pressing need, the inefficiencies of democracy, instead of being corrected by adaptation, might be accentuated to further danger points.

The anxiety which I feel in viewing this prospect results principally from my awareness of the enormous size and complexity of the task and of any governmental mechanism which seeks to cope with it. Social and economic planning, as an engineering ideal, is limited by the all too human capacities of the engineers. The burdens upon the few who occupy the control rooms are heavy beyond the conception of those outside. No one is capable of gaining detailed familiarity with the mechanism as a whole. It is here, in my opinion, that is to be found the strongest argument for *laissez faire*.

But *laissez faire* is passing away, probably never to return unless as a result of such a breakdown of social organization as would require the human race to start again from some point lower than we have now attained on the ladder of social evolution. Under the impact of science we seem doomed to an increasing complexity in social and economic life and an increasing necessity for the development of over-all controls, for the administration of which inexhaustible human capacities are increasingly inadequate.

It is this terrifying dilemma which is primarily responsible for my sense of the extreme importance of the third proposition which I have advanced above. Every governmental function which can be legislated for and administered efficiently at a local level should be retained there in order to conserve the energies of legislators and administrators at wider levels. Only if this principle is followed will there be enough energy and competence to go around—will there be enough managerial capacity to keep the entire social mechanism of democracy in efficient operation. (Concluded on page 257)

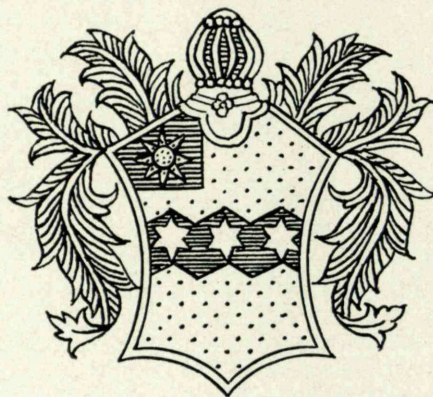




C. B. COTTRELL  
CLAYBOURNE  
WESTERLY, R.I.  
CHICAGO

**25,000,000 IMPRESSIONS**  
**PER MONTH**





# 25,000,000 IMPRESSIONS

## PER MONTH . . . THE STORY OF PRESSWORK AT THE RUMFORD PRESS

THE ESSENCE OF FINE PRESSWORK IS *precision* in the preparation of forms. Plates which micrometer to the thousandth part of an inch, and fractions thereof, in their relief printing surfaces, must be placed on presses which also are adjusted and constantly maintained at a corresponding degree of accuracy.

Then comes the human element — men — who know how to mix ink and make the combination of press and plates perform to perfection.

There is an art to this sort of craftsmanship which is self-evident. Starting with the essence of it, precision in plate-making, Rumford is prepared to meet any comparison with the finest of letterpress results on illustrative printing, whether in one or four colors; and this

challenge also applies to the printing of type, whether on antique or coated papers.

Our pride in our presswork is justifiable, we think, because we maintain the small de luxe print-shop *spirit* in the presence of an immense mechanical equipment. Sixty-odd presses, including a large battery of high-speed small automatics, are operated night and day with two complete shifts of personnel. Our chief satisfaction, therefore, is that despite the bigness of our task of production, despite the ever-present demand for rapid delivery, The Rumford Press always has delivered a grade of presswork which matches the most careful standards of the best printing done today.

## THE RUMFORD PRESS . . . CONCORD, NEW HAMPSHIRE

BOSTON  
8 ARLINGTON STREET

NEW YORK  
341 MADISON AVENUE



## HOW EFFICIENT IS THE STATE?

(Concluded from page 256)

I am calling for a policy of conservation of human competence and energies, applied to the efficient operation of our socioeconomic governmental order. I believe this to be wholly compatible with and essential for the preservation of democracy in the United States under the competition of totalitarian states. If and when this policy is applied, I believe that we need have no cause to fear, since the long-run effects of totalitarianism, as I have already contended, are not conducive to the development of the types of competence and energy which we seek to conserve.

## THE TEACHING OF ARCHITECTURE

(Concluded from page 240)

seems to be as indispensable to the regular production of highly accomplished first-rate men, as is a course of daily discipline to making the most of average men. Happily, in the study of architecture at least, both may be done at once. The same appliances that serve to start the man of talent upon a successful career, set the man of genius on his way to the stars.

There can be no more mistaken or mischievous notion, it seems to me, than that there is a natural conflict between men of natural force and genius and men of education, unless, indeed, it is the notion, that, when they are brought into conflict, it is the self-trained man of genius who holds his own, and the man of education that goes to the wall. . . .

We have in this country the most intelligent population in the world; I mean not only that more persons have reached that stage of intellectual development at which an advanced culture becomes possible, but that

a certain quickness of intellectual sympathy, a readiness to understand things as they really are, and to act accordingly, is a characteristic of those persons. Now, Architecture, of all the arts, most distinctly requires this sort of intelligence. It is founded on necessity, and is amenable to reason. We are making great strides in material prosperity and in public and private magnificence; and Architecture, of all the arts, most directly ministers to a proper pride. There is every reason, then, to hope for an abundant reward for our labors in the near future. There can be no want of good seed; the moral temperature promises to be favorable; we have only to prepare the ground.

It is said of the ancient Jews, that, while all the nations of the Gentiles cherished glorious traditions of a fabulous past, they alone, though not without a history, set their golden age in the future. The people of the United States, in like manner, equally conscious of being a chosen people, set apart to preserve the sacred ark of Liberty, and transmit the true faith to the nations, habitually dwell in imagination, not on the glorious past, but upon the still more glorious time to come. In the career which that time has in store, no one would deny that the development of the arts is an essential element; and, of all the arts, Architecture has most immediately to do with the greatness of the commonwealth. It is by the aspect of its buildings that a great country asserts its greatness. The buildings of any people cannot fail, indeed, like their personal conduct, to be in a certain sense individual and characteristic; but it is of grave importance that our public buildings, as well as our natural manners, shall be also excellent in themselves, and that they shall express our best characteristics. It is the aim of this School to do what it can, in its day and generation, to insure that the Architecture of the future shall be worthy of the future.

# PREPARATORY SCHOOLS FOR BOYS

## CHAUNCY HALL SCHOOL

Founded 1828. The School that confines itself exclusively to the preparation of students for the Massachusetts Institute of Technology.

FRANKLIN T. KURT, *Principal*

553 Boylston Street, Boston, Mass.

## CRANBROOK SCHOOL

Distinctive endowed preparatory school for boys. Also junior department. Exceptionally beautiful, complete, modern. Unusual opportunities in music, arts, crafts, sciences. Hobbies encouraged. Broad program of sports. Single rooms. Strong faculty. Individual attention. Graduates in over 50 colleges. Near Detroit. Overnight from New York.

REGISTRAR

5330 Lone Pine Road, Bloomfield Hills, Michigan

## HEBRON ACADEMY

Thorough college preparation for boys at moderate cost. 81 Hebron boys freshmen in college this year. Excellent winter sports facilities. Ski trails, ski camps. Covered skating rink. Experienced winter sports coach.

*For catalogue and illustrated booklet address*

RALPH L. HUNT, *Principal*

Box T, Hebron, Maine

## HUNTINGTON SCHOOL FOR BOYS

Five Forms. Special two-year course for entrance to M.I.T.

Summer Session (Co-educational)

Send for catalogues

CHARLES H. SAMPSON, Ed.M., Headmaster

320 Huntington Ave., Boston

Tel. Kenmore 1800

## OXFORD ACADEMY

Assures preparation for M.I.T. and other colleges if student accepted by us, irrespective of previous difficulties. Socratic-psychological method, 30 years without a failure. Each student in a class by himself. Taught concentration, how to study. Limited to 15 boys. Enroll any time.

*Catalog.*

DIRECTOR, Box M-95, Pleasantville, N. J.

## FOR LISTING IN THIS SECTION

Apply to

BUSINESS MANAGER

THE TECHNOLOGY REVIEW





**MANHATTAN RUBBER PRODUCTS**  
for Industry

Thomas H. Boyd, '23  
Wilder E. Perkins, '25  
Charles P. McHugh, '26  
Daniel J. Hanlon, '37  
Robert Tischbein, '38

Transmission and Conveyor Belts  
Hose for every service  
Friction Materials  
Molded Rubber Products  
Rubber Linings and Coverings  
Abrasive Wheels  
Bowling Balls

**THE MANHATTAN RUBBER MANUFACTURING DIVISION**  
of Raybestos-Manhattan, Inc.  
36 TOWNSEND STREET PASSAIC, N. J.

William H. Coburn, '11 William F. Dean, '17

**William H. Coburn & Co.**  
INVESTMENT COUNSEL

68 Devonshire St. Boston, Mass.

**MONSANTO CHEMICAL COMPANY**  
*Merrimac Division*

EVERETT  
MASSACHUSETTS

*The largest and oldest  
chemical manufacturer in New England*

## FIDELITY DRUM SPOOLING MACHINE

### OTHER FIDELITY MACHINES

Braiders  
Backwinders  
Circular Knitting  
Machines  
Cylinders and Dials  
5-Color Yarn Selector  
& Knot Tyer  
Fringe & Tassel Machines  
Giant Package Winders  
Raschel Machines  
Ribbers  
Wire Covering Machines  
Belt Loop Cutters  
Pocket Folding Machines  
Special Machines  
designed and built

For efficient multiple-spool winding with uniformly smooth lay. Wooden or paper spools. Winds from barrel or pin swifts, cops, cones, etc. Write for catalog.



**FIDELITY MACHINE CO.**  
3908-18 Frankford Ave., Philadelphia, Pa.

## THE INSTITUTE GAZETTE

(Concluded from page 246)

the Technology Matrons, as well as the officers of the Technology Dames and the Women's Association.

When President Maclaurin was leading the Institute ably and successfully through periods of vast expansion and wartime service, Mrs. Maclaurin's work in organizing and expanding the activities of Technology women was a worthy complement to his. In a dedication address, Mrs. Murray P. Horwood, '19, speaking as chairman of a committee appointed by President Compton to administer the Emma Rogers and Alice Maclaurin rooms, said that Mrs. Maclaurin, with characteristic modesty, wanted to be sure that the women did not labor under any false idea of what her part had been. Mrs. Horwood pointed out, however, that it was well known that Mrs. Maclaurin helped to establish the matrons' organization on its present firm basis; that during her association with them, they moved into the present delightful rooms; that Mrs. Maclaurin helped in the decoration and arrangement of the rooms; and that her suggestion of the name, Technology Matrons, was the one finally adopted by the organization.

### In Perpetuity

**A**LUMNI who were graduated from the Institute during its years in Boston will be particularly interested in the news that the name of Ralph Huntington, which was given to Huntington Hall in the old Rogers Building many years ago, and that of Henry L. Pierce, for whom the Pierce Building in Trinity Place was named, are now perpetuated in the present Institute. The name of Huntington Hall, rich in memories to generations of Technology men, has been given to the Institute's largest lecture hall, known until recently by the coldly numerical title, "Room 10-250," and that section of the Institute's main educational buildings bordering on Massachusetts Avenue nearest Memorial Drive is now the Henry L. Pierce Engineering Laboratory.<sup>125</sup>

Ralph Huntington, a member of the Institute's Corporation from 1862 until his death in 1866, was actively interested in the Institute's progress and gave generously to its support at a time when such support was much needed. Mr. Pierce, who left a large bequest to the Institute, served on the Corporation from 1885 until his death in 1896. He was mayor of Boston in 1872 and again in 1878, and a member of Congress between his mayoral administrations. Huntington Hall and the Pierce Engineering Laboratory were named by vote of the Executive Committee of the Corporation, following recommendations by the Advisory Committee on Fine Arts and Memorials. The suggestion for the naming of the Pierce Laboratory came from the Alumni Association's Committee on Historical Collections and completes the naming of the buildings which compose the façade of the Institute group on Massachusetts Avenue.

# PROFESSIONAL CARDS

## JACKSON & MORELAND

*Engineers*

Public Utilities — Industrials  
Railroad Electrification  
Design and Supervision — Valuations  
Economic and Operating Reports

BOSTON

NEW YORK

## FAY, SPOFFORD & THORNDIKE

ENGINEERS

BOSTON, MASS.

BRIDGES

WATER SUPPLY AND SEWERAGE

PORT AND TERMINAL WORKS

FIRE PREVENTION

INVESTIGATIONS

DESIGNS

SUPERVISION OF CONSTRUCTION

## H. K. BARROWS, '95

M. Am. Soc. C. E.

CONSULTING HYDRAULIC ENGINEER

*Hydro-electric developments — Water supplies. Reports, plans,  
supervision. Advice, appraisals.*

6 BEACON STREET

BOSTON, MASS.

## STANLEY G. H. FITCH '00

CERTIFIED PUBLIC ACCOUNTANT

*of* PATTERSON, TEELE & DENNIS

1 Federal Street, Boston, Mass.

*Cost Accountants and Auditors — Tax Consultants*

NEW YORK

BOSTON

WASHINGTON

REPRESENTATIVES IN OTHER PRINCIPAL CITIES OF THE  
UNITED STATES, CANADA, ENGLAND AND AUSTRALIA

## EADIE, FREUND AND CAMPBELL

CONSULTING ENGINEERS

110 WEST FORTIETH STREET

NEW YORK CITY

*Plans and Specifications — Examinations and Reports*

Power, Heating, Ventilating, Electric, Plumbing,  
Sprinkler, Refrigerating, Elevator Installations, etc.,  
in Buildings and Industrial Plants

J. K. CAMPBELL, M. I. T. '11

## MAURICE A. REIDY

*Consulting Engineer*

BRIDGES

BUILDINGS

STRUCTURAL DESIGNS

FOUNDATIONS

CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

*Estimates and Appraisals*

44 SCHOOL STREET

BOSTON, MASS.

## DAY & ZIMMERMANN, INC.

*Engineers*

W. FINDLAY DOWNS '15, Pres.

Design — Construction — Management

Investigations and Reports

Public Utilities and Industrials

New York

Philadelphia  
PACKARD BLDG.

Chicago

## EVERETT E. KENT

*Registered Attorneys in*

*Patent, Trade Mark and Copyright Causes*

*United States and Foreign*

75 Federal Street, Boston

HUBbard 0234

F. L. LAZO, C. Eng. '21

M. L. DEHESA G. FARIAS, Architect

J. MARTÍNEZ T., Mech. Eng.  
(Cornell '25)

*Engineers and Architects*

PLANS AND SPECIFICATIONS — EXAMINATIONS AND REPORTS

Construction Consultants—Power, Public Utilities, Heating, Architect and Arch. Engrs.  
Ventilating-Refrigerating-Ind. Plants—Estimates and Valuations

Av. MADERO No. 1

MEXICO, D.F., MEXICO

## GEORGE T. SOUTHGATE '10

*Electrical and Thermal Engineer*

Consultant in

APPARATUS, PROCESS and PATENT MATTERS

*Office and Laboratory*

114 East Thirty-second Street

New York, N. Y.

Telephone

LExington 2-8130



*AN AID TO INDUSTRY IN LOCATING OUTSTANDING MEN*

---

## INDUSTRY IS ASKING

“Where can we find a man to . . . . . ?”

“If we promote Jones who will take his place?”

“Who knows how to . . . . . ?”

For the answer to these and other questions involving personnel, we invite your inquiries.

PLACEMENT BUREAU

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CAMBRIDGE, MASS.

---

*AN AID TO ALUMNI IN FINDING DESIRABLE POSITIONS*

♪♪ When Good Fellows Get Together ♪♪

# M.I.T. ALUMNI DAY

JUNE 3, 1940

★ Classes whose numerals end in 0 and 5 are planning reunions just preceding or following Alumni Day, in order that all attending these gatherings may come “back to Tech” on Monday, June 3, to enjoy Alumni Day festivities.

★ In the morning of Alumni Day will be held a conference on “Communications”—a timely and interesting discussion of the human and technical facilities which bring you news and opinion from all parts of the world. . . . During the day there will be exhibits in both the Main Lobby and Rogers Lobby depicting the scientific progress in the transmission of intelligence by wire and radio. . . . At noon the luncheon will be served in Du Pont Court, where Alumni, wives, and guests will meet and eat. . . . The afternoon will witness traditional Class Day Exercises in which the Alumni initiates of 1940 share honors with the twenty-fifth (1915) and fiftieth (1890) reunion Classes. . . . Following this event, Technology’s swimming pool, which Alumni have given to the Institute, will be dedicated and opened for inspection. . . . The culminating event of Alumni Day will be another Stein-on-the-Table Banquet at the Hotel Statler—an evening replete with fun and gaiety—the zenith of a day of good fellowship.

The cost of a **TICKET** for all the **OFFICIAL EVENTS**  
of **ALUMNI DAY** will be only **\$5.00**

♪♪ When Good Fellows Get Together ♪♪



# TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI AND OFFICERS

## Our Busy Staff

☐ JOHN E. BURCHARD '23, Director of the Albert Farwell Bemis Foundation, lectured on "The Modern House," Dartmouth College, February 28. The next day he was elected chairman of the board of directors of the Metropolitan Housing Association of Greater Boston.

☐ JESSE DOUGLAS, formerly of the Department of Mathematics, received the Townsend Harris Medal from the College of the City of New York.

☐ ARTHUR C. HARDY '18, Professor of Optics and Photography, appointed secretary of the Optical Society of America.

☐ GEORGE R. HARRISON, Director of Research Laboratory of Experimental Physics, made editor of the *Journal of the Optical Society of America*. Professor Harrison was the subject of the "Personalities in Science," page of *Scientific American* for March.

☐ CARYL P. HASKINS, research associate, wrote for the *Harvard Alumni Bulletin*, February 2, "A People of Another Age," the army ant.

☐ JEROME C. HUNSAKER '12, Professor in Charge of the Department of Aeronautical Engineering, on January 26 spoke on "The History of Aeronautics" before the Grolier Club, in connection with an exhibition of the Burden Collection.

☐ DUGALD C. JACKSON, Emeritus Professor of Electric Power Production and Distribution, lectured at the University of Notre Dame on "The Part Played by Engineering and Architecture in the Development of Civilization," February 10.

☐ DUNCAN A. MACINNES, formerly of the Department of Chemistry, wrote an entirely new treatise, *The Principles of Electrochemistry*, Reinhold.

☐ JOHN R. MARKHAM '18, Assistant Professor of Aeronautical Engineering, spoke to the Springfield, Mass., section, American Institute of Electrical Engineers, and the Engineering Society of Western Massachusetts on the "New Wright Brothers Wind Tunnel at the M.I.T.," February 20.

☐ KENNETH C. REYNOLDS '25, Associate Professor of Hydraulics, this winter has been the principal speaker in the series of John R. Freeman Lectures on Hydraulics, in Boston.

☐ HERVEY W. SHIMER, Professor of Paleontology, reviewed Percy E. Raymond's *Prehistoric Life in Science* for February 9.

## Authors

☐ ANDREY A. POTTER '03, an article, "Research and Invention In Engineering Colleges," *Journal of the Patent Office Society*, February.

☐ RALPH T. WALKER '11, excerpts from an address before the Architectural League of New York, "Nipponese Impressions," *Architectural Forum*, February.

☐ CHARLES EDISON '13, an article, "New Engineering In The Navy," *Scientific American*, March.

☐ HOWARD H. DAWES '23, an article, "Modernization of Broadcast Frequency Monitors," *General Radio Experimenter*, February.

☐ PRESTON M. PUTNAM '25, text of an address, "Concrete Design for Large Pre-cast Concrete Pipe," *Journal of the Boston Society of Civil Engineers*, January.

☐ DONALD F. HORTON '27, text of an address, "Flood Control and Its Relation to Problems of Stream Pollution," *Journal of the Boston Society of Civil Engineers*, January.

## Official

☐ ALONZO J. HAMMOND '91, chosen president of the American Engineering Council.

☐ FREDERICK MATHESIUS '02, made chairman of the committee on multiple-unit housing, American Institute of Architects.

☐ HOWARD S. MORSE '03, elected president of the Indianapolis Convention and Publicity Bureau.

☐ ALBERT HARKNESS '12, made chairman of the judiciary committee, American Institute of Architects.

☐ CLAIRE W. RICKER '14, installed as second vice-president, Louisiana Engineering Society.

☐ ARTHUR M. HILL '27, installed as secretary, Louisiana Engineering Society.

## We Read . . .

☐ That SAMUEL V. CHAMBERLAIN '18 made a series of etchings of restored Williamsburg, Va., exhibited, in March, at the Grand Central Galleries.

☐ That NAOMI C. TURNER '26 believes that many so-called colds actually may be mild cases of such children's diseases as measles, chicken pox, and scarlet fever.

☐ That IVAN A. GETTING '33 is to be a lecturer this year at Harvard's summer conference on astronomy.

☐ That ATHELSTAN F. SPILHAUS '33 was the guest speaker at a dinner meeting of the Aviation Club of Syracuse in January. His topic was "Meteorology in Its Application to Transport and Private Flying."

☐ That WILLIAM BARTON ROGERS, founder, was the subject of an article by Arthur Bevan, state geologist of Virginia, in *Scientific Monthly*, February.

☐ That GJON MILI '27, using the Edgerton [27] technique and Kodachrome film, took the first high-speed photographs of ballet dancers ever filmed in color. These were reproduced in *Life*, February 19.

## DEATHS

\* Mentioned in class notes.

☐ SAMUEL S. GANNETT '83, August 5.

☐ JOHN W. TAPPAN '86, September 2.

☐ JOHN E. KREPS '87, September 29.\*

☐ WILLIAM D. SARGENT '87, February 15.

☐ LUDWIG WEILLER '91, August 6.

☐ AMASA WALKER '93, December 26.

☐ ARTHUR ELSON '97, February 24.

☐ HOWELL FISHER '98, February 10.

☐ PHILIP STOCKTON '99, February 11.

☐ LEWEN F. SEARLE '00, date not known.\*

☐ ALEXANDER J. TAYLOR '01, February 27.

☐ DANIEL S. WILSON '03, February 6.

☐ ALICE MCCARTHY '04, February 5.

☐ EDWARD R. HYDE '06, February 5.

☐ FREDERICK WILLCOX '06, January 5.

☐ JOHN P. CHADWICK '07, February 4.\*

☐ JOHN L. PULTZ '07, June 15.\*

☐ CARL W. KENISTON '08, May 14.

☐ ARTHUR NORTON '09, February 24.

☐ HIROSHI YOSHIKAWA '16, April 13, 1939.

☐ KETCHUM ALEXANDER '17, July 16.

☐ THOMAS B. THRIGE, JR., '22, January 26.

☐ HORACE T. MANN '25, February 8.

☐ D. M. VAN COLT '36, February 18

# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *A.I.M.E.*

Because Technology was well represented among those who actively participated in the conference of the American Institute of Mining and Metallurgical Engineers, Inc., celebrating its seventieth year of existence, we include this account with our club notes. The meeting was held February 12 through 15 in the Engineering Societies Building in New York City, with a dinner at the Waldorf-Astoria.

Pete V. Martin '23, received the J. E. Johnson, Jr., Award, at the annual banquet, "for his published research on the 'Effect of the Solution-loss Reaction on Blast-furnace Efficiency.'" At the same banquet Franklin B. Richards '84 was one of the ten members of the Class of 1890 Legion of Honor to be welcomed.

Tech men who chairmened sessions of the conference include Charles E. Locke '96, who was associate chairman of the afternoon session of "Methods of Milling Industrial Minerals"; Robert H. Leach '00, who was vice-chairman of the "Institute of Metals" lecture, and who, with Cyril S. Smith '26, was associate chairman of the first session of "Recrystallization"; Gerald F. Loughlin '03, vice-chairman of the morning session of "Mining Geology"; Paul M. Tyler '12, associate chairman of the "Economics of Industrial Minerals" symposium and general discussion; Arthur F. Taggart '13, associate chairman of the morning session of the "Milling Methods" program; John T. Norton '18, who was associate chairman of the third session of "Recrystallization"; Robert H. Aborn '20, associate chairman of "Austenitic Stainless Steels"; Basil B. Zavoico '24, vice-chairman, with W. P. Haynes, of the morning session of the "Symposium on Oil Production, Foreign and Domestic," and chairman of the afternoon section; and John Chipman, Staff, who was associate chairman of the second session of "Chemistry of Steel-making." Joseph W. Barker '16, Archer E. Wheeler '95, and Ralph B. Williams '04 served on the banquet committee, while Barker and John T. Sherman '31 acted on the informal dance committee.

Names of Technology men presenting papers at the conference make an imposing list: Elmer A. Holbrook '04 gave a committee report on "Graduate Study" and led a discussion on the "Professional Development of the Mining and Metallurgical Engineer." Guy C. Riddell '04 spoke on "Mineral Property Valuation"; A. F. Taggart, on "A Proposed Course in Mineral Dressing"; Clyde P. Ross '14, on "Quicksilver Deposits of the Mt. Diablo District, California"; William L. Dennen '17 with W. W. Wirth, on "Develop-

ment and Application of Artificial Mine Roof Support Used in the Anthracite Region"; Julian M. Avery '18, on "Thermochemistry of the Pig-iron Blast Furnace"; J. T. Norton, on "Changes in Damping Capacity during Annealing of Alpha Brass"; Wilber S. Burbank '19, "Control of Ore Deposition in San Juan Mountains, Colorado"; Philip B. Bucky '20 with David Sinclair, "Photoelasticity and Its Application to Mine Pillar and Tunnel Problems"; Charles H. Hertzy, Jr., '21, "Slag Control"; Hugh E. McKinstry '21, "The Shape of Vein Fractures and Its Influence on the Location of Ore Shoots"; and Francis G. Wells '22, "Chromite in Southwestern Oregon and Northern California."

Walter H. Newhouse '23 spoke on "Correlation of Type of Ore Deposit with Type of Faulting," and "In Memoriam — Waldemar Lindgren, The Educator"; Robert D. Butler '32 also spoke of Dr. Lindgren in his capacity of "The Professor." B. B. Zavoico talked on "Russia" in regard to its oil production; Raymond Mancha, Jr., '26, "Effects of Underground Stopping Leakage upon Mine Fan Performance"; Thomas S. Washburn '26 with C. F. Quest, "Tensile Strength and Composition of Hot-rolled Plain Carbon Steels"; Norman D. Fitz Gerald '31, "Economic Dynamics of Motor Fuel Demand"; John T. Burwell, Jr., '34, "Crystal Orientation in Silicon-iron Sheet"; Reinhardt Schuhmann, Jr., '38, "Principles of Comminution, I-Size Distribution and Surface Calculation"; John Chipman with Karl Fetter, "Slag-metal Relationships in the Basic Open-hearth Furnace"; and George B. Waterhouse, Staff, a committee report on the "Engineers' Council for Professional Development Activities."

### *M.I.T. Association of Buffalo*

On Tuesday evening, February 13, about forty Alumni gathered at the University Club for a dinner meeting. Following a short treasurer's report, Marvin Gorham '93 informed us on his activities as honorary secretary for the Buffalo district. His main task is aptly phrased as "freshman sifter." — Following the recommendations of the nominating committee, Marvin Gorham and Whitworth Ferguson '22, the Association elected the following officers for the new year: John D. Rumsey '33, President; Timothy J. Coleman '34, Vice-President; and Albert M. Patterson '33, Secretary-Treasurer.

The program for the evening included talks by three United States Army men: Phillip W. Booker, colonel of the Field Artillery; Arcadi Gluckman, major in the Infantry; and Arthur L. Lavery, major in the Coast Artillery Corps. These men gave very interesting talks on the recent progress and developments in organization, training, and equipment in

the United States Army, and sound movies on "Cavalry Training" and "Aeronautical Attack and Defense Methods" were shown. — ALBERT M. PATTERSON '33, *Secretary*, 216 Summer Street, Buffalo, N.Y.

### *Technology Club of Central Pennsylvania*

The first meeting of the year was held at the University Club, 7 North Front Street, Harrisburg, on Wednesday, January 24. Because William M. Davidson '26 has been transferred to Wilkes-Barre, Louis S. Morse '96, our President, announced that Harold R. Spaans '30 has been appointed to the secretaryship. Two assistants have also been appointed, one for York and one for Lancaster: John P. Connelly '28 and Breese J. Stevens '23, respectively. — We were fortunate to have as our speaker Elmer A. Holbrook '04, dean of engineering, University of Pittsburgh. His talk, "Some Problems of a Professional Engineer," was both interesting and thought provoking.

Two father-and-son combinations were present: Percy E. Tillson '06 and his son, Henry C. Tillson; and Donley J. Parr from Hershey, Pa., with his son, D. J. Parr, Jr. We hope that these two boys will be our representatives in the Class of 1945. Threatened bad weather, illness, and business trips cut down our attendance. The following Alumni were present: Louis S. Morse '96, Edgar A. Weimer '98, Harry W. Goldthwaite '99, Elmer A. Holbrook '04, Percy E. Tillson '06, Clifford J. Walton '14, Francis E. Thomas '17, Eldor J. Mink '22, John P. Connelly '28, Harold R. Spaans '30, and Emil T. P. Neubauer '33. — HAROLD R. SPAANS '30, *Secretary*, 1819 Elm Street, New Cumberland, Pa.

### *M.I.T. Club of Northern New Jersey*

On February 1, 158 members of the Club had one of the grandest parties any group of Tech men ever had: Bill Rose '22 was our host at the Christian Feigenspan Brewing Company's P.O.N. plant in Newark. There, on a friendly and most attractive balcony overlooking the shiny copper beer stills, we had steaks, chops, P.O.N., songs, steaks, P.O.N., chops, P.O.N., seemingly without limit. Charley Roche '23 organized an orchestra, and it was good. When they rested, Jack Teeter '22 and his accordion kept us in continuous song. Somehow or other Bill Grady '22, chairman of the affair, managed to get the fellows quiet for a minute or two so that he could present a pipe to Bill Rose as a gift from the Club. Then and there one of the finest things happened: Bill Rose brought to our attention the presence of George M. Warner '91, a



charter member of the Club who has missed only one meeting since the beginning, and he appointed Bill Grady and Bill Coleman '24 a committee to see to it that George Warner's fiftieth reunion is properly celebrated next year.

The annual banquet will be held on Thursday, May 2, at the Newark Athletic Club. Edwin H. Armstrong will demonstrate his system of wide-band frequency-modulated broadcasting. For an excellent article on Major Armstrong, see *Fortune* for October. F. Alexander Magoun '18, Associate Professor of Humanics at the Institute, whose fame has been heralded in New Jersey by Art Windle '18 and Frank Maguire '17, will be the frosting on the cake — sounds like a swell party. — CLAYTON D. GROVER '22, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. FREEMAN B. HUDSON, JR., '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N.J. NEWTON S. FOSTER '28, *Assistant Secretary*, 73 Daniel Avenue, Rutherford, N.J.

### Technology Club of New York

A record group of 178 men attended the annual Course XV dinner at the Club on January 31. Erwin H. Schell '12, Professor of Business Management, and Floyd E. Armstrong, Professor of Economics and Finance, came down from the Institute. Professor Schell spoke on "The Challenge before Course XV," outlining the current developments and future plans for the Course. Professor Armstrong spoke on "The Challenge of 1940," presenting a searching analysis of current economic conditions and offering a few personal predictions on coming events.

"Nineteen-forty," he said, "will be a moderately good year. After that and if the present European war does not develop to proportions which would require large supplies of materials, we will have the corrections for the extravagances of the past few years. There will be a drastic decline in commodity prices and a severe increase in unemployment. Prices will hit a new depression low, even lower than 1932, with successive waves of liquidation. This will last for a period of eighteen months to two years, after which, with a firm economic foundation, prices will rise and conditions will improve as we enter a new period of sound prosperity."

Professor Armstrong based his predictions on the facts that the people and Congress are gradually swinging to the conservative side and that this tendency will become even more pronounced with the coming elections. There will be demands to "end experimentation" and to return to more orthodox means of handling the national economy. These demands, he felt, would result in a sharp decrease in government spending which would form the basis for the new depression. Professor Armstrong explained, however, that all these predictions would be nullified by great increase in activity resulting in the placement of large orders for war supplies in this country.

Twenty-one men attended the Class of 1919 dinner held at the Club on February 20. This dinner was one of several class gatherings at the Club during February. — JAMES P. EDER '34, *Secretary*, 24 East 39th Street, New York, N.Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N.Y.

### Technology Club of Schenectady

On February 1, the group played host to President Compton, who was in town for some speaking engagements at the General Electric Company. After joining us at dinner he proceeded to the WGY studio to broadcast on the science forum program and subsequently returned to discuss the affairs of the Institute. Both his radio talk and his informal discussion were attentively received and greatly appreciated.

There was a very good attendance, the occasion drawing members from distances up to fifty miles. Several co-operative students were present and so were a few prospective students. Everyone enjoyed the evening and left feeling that he had up-to-date knowledge of Institute affairs. — THERON C. JOHNSON '33, *Secretary*, Engineering General Building 23, General Electric Company, 1 River Road, Schenectady, N.Y.

### Technology Club of Shanghai

Before giving a review of our club activities after the summer recess, the 1939 executive officers wish to express appreciation of the hearty support which made their duties so light and so pleasant, and to welcome and wish every success to the officers elected for the present year.

The Club was late in starting its fall season; so there were only three meetings for the second half of 1939. The October meeting, held on the twenty-fourth at the American Women's Club, was presided over by K. T. Lee '19 in the absence of T. F. Wei '20, President, who was away from town on business. Julean Arnold, the American commercial attaché, spoke on "What Can the M.I.T. Graduates Do about It?" The gist of his talk was that we should work together as "an American football team" and that we should be public spirited. His talk was very candid and highly inspiring. He advocated that the M.I.T. members start some project most fitted to the training of the group, mentioning specially the training of auto mechanics. T. K. Kao '15 thanked the speaker on behalf of the Club.

In place of the November meeting, we were guests of the Harvard Club at the American Club on the fifteenth. There must have been nearly two hundred persons at the meeting, including many distinguished guests, such as His Excellency Dr. Alfred Sze. The meeting was most capably conducted by Horace H. Smith, the Harvard Club President. Dr. John C. Ferguson spoke on "An American University Graduate in China." Julean Arnold told his own story of how he became an honorary member of the Harvard Club of Spokane. All those present enjoyed the

meeting immensely. We appreciated it the most, of course, because it was arranged for our benefit.

By far the most successful meeting, as a get-together among ourselves, was the December one, held in the restaurant of the Great Eastern Hotel on the nineteenth. Four tables of delicious Cantonese food were served, including shark's fin, sparrow's nest, suckling pig, and so on. Ki Chun '20, Waken Chang '28, Y. M. Kuo '19, Walter Kwok '27, P. Y. Tang '23, and T. F. Wei footed the bill. President Wei was kept away for the second time — this time by illness. Walter Kwok presided at the meeting after the dinner.

The following business was transacted at this final get-together for 1939: G. H. Lynott '15 of the American Bank Note Company was elected president; T. K. Hsueh '24, of the Yung Tai Silk Filature, secretary and treasurer; Harold T. Chang '36, architect, assistant secretary and treasurer. The nominating committee consisted of T. C. Hsi '15, T. Yuan '16, and T. H. Chou '26. The members gave a vote of thanks to the retiring administration. T. H. Chou, outgoing Secretary-Treasurer, thanked the members for their support and reported on the successful results of the entertainment fund campaign: The number of members pledged by December 19 was 45; the total sum pledged was \$2,928.

An open discussion followed on the subject "What Can M.I.T. Men Do about It?" P. Y. Tang, Waken Chang, and P. King '26 suggested that the Club lend support to the Shanghai Polytechnic Institute, a school for training industrial workers to become efficient foremen or overseers. Paul S. Hopkins '10, George A. Flynn '28, and others expressed their opinion in favor of supporting such an institute on principle. All members present, by raising hands, held the same view, and proposed that a committee, to be appointed by the President-elect, be formed to look into the matter. — TSUKANG HSUEH '24, *Secretary*, Care of Walter Kwok, Room 420, 406 Kiangse Road, National Commercial Bank Building, Shanghai, China. HAROLD T. CHANG '30, *Assistant Secretary*, same address.

### Technology Club of Lower Ontario

An excellent meeting was held on December 12, with about twenty in attendance to honor Dugald C. Jackson, who was in Toronto at the time, making a survey of the engineering courses of the University. Dr. Jackson told of present-day activities at M.I.T., where he is Emeritus Professor of Electric Power Production and Distribution, and also gave some very pleasant reminiscences of his wide activities in the past, particularly of his travels in Japan. Henry H. Tozier '96 showed his Kodachrome pictures of the Yellowstone National Park. — Our Secretary, Charles W. Sampson '29, has been moved to Rochester, N.Y.

At a luncheon meeting in Simpson's Arcadian Court, Toronto, February 15, the following officers were elected: Hon-

orary President, Henry H. Tozier; President, John S. Keenan '23, 29 Rosedale Heights Drive, Toronto; Vice-President, Strathy R. Mackellar '12; Secretary, Valentine W. G. Wilson '28; Treasurer, Bernard H. Morash '12; and Executive Committee, Harry S. Chandler '08 and Henry H. Tozier. — VALENTINE W. G. WILSON '28, *Secretary*, 92 Scarboro Road, Toronto, Ontario, Canada.

### *Washington Society of the M.I.T.*

The Society held its January meeting on the nineteenth at 5:30 P.M. at the Y.W.C.A. at 17th and K Streets. We had John E. Burchard '23, director of the Albert Farwell Bemis Foundation at the Institute, as master of ceremonies, introducing a corps of guest speakers, including Pierre Blouke '19 of the Home Owner's Loan Corporation; Miles L. Colean, assistant administrator of the Federal Housing Authority; Baird Snyder, 3d, '24, formerly of the Farm Security Administration; A. C. Shire, technical director for the United States Housing Authority; John Ihlder, executive director of the District of Columbia Alley Dwelling Authority; and Hugh L. Dryden of the National Bureau of Standards.

Professor Burchard began by analyzing housing as a problem too large to discuss in a session like this, with its many phases of bankers' equity, realtors' market, architects' problems, problems regarding how to get into the small house field, tenants' problems of small rent, owners' problems, health and sociological problems. However, he felt that economics was a common base for study and offered a common ground of concern to poor and rich alike. Authorities have for ages raised the questions as to whether the building industry is out of date with codes, labor, and capital restrictions, and as to whether it is out of line with other industries in regard to man-hour productivity and general improvement of the industry. Mr. Burchard questions whether we should change the industry, assist those for whom the industry does not provide, or try to make the industry itself more effective.

Pierre Blouke described the establishment of the H.O.L.C., its purpose to relieve the small home owner, the fact that it had refinanced over a million dollars' worth of property in three years, handled over 750,000 separate contracts. Donald H. McNeal '23 is the head of the organization. The five directors are the same as those of the Federal Home Loan Bank Board, headed by John H. Fay, the latter organization directing the home financing operations. Basically, the program is a conservation move enabling distressed owners to keep their homes. At the present time the board is studying how to preserve neighborhoods, as well as individual homes.

Miles L. Colean, a Columbia graduate, assistant administrator of the Federal Housing Authority, stated that his is also, in a way, a financing agency and is confused with the H.O.L.C. and the U.S.H.A. There are some essential differ-

ences between the F.H.A. and the old mortgage guarantee companies which were bankrupt: First, the F.H.A. does not pay until three years after the original term of default; second, all mortgages are written on an amortization basis which lessens risks; third, a uniform method of appraisal makes safer the job of insuring the two and one-half million mortgages, losses to date running to 14/1,000 of 1 per cent. Single-family houses and rental properties are insured; also personal credit loans for modernization and repairs of nearly a million dollars a week.

Baird Snyder, 3d, now of the wages and hours division but formerly of the Farm Security Administration of the Department of Agriculture, described how that agency inherited resettlement projects, took direct action on emergency relief, made loans up to 100 per cent, worked on trial and error to develop the cheapest type of house, built twenty thousand farm houses, giving people at least a dry back in small communities, providing for the needs of the lower third of farm families. Another major experiment was in building thirty-three camps for migratory laborers, providing shelter and furnishing homes to which the migratory laborer could move, starting as a renter instead of a wanderer.

A. C. Shire was the next speaker, describing how the U.S.H.A. lends money to provide low-cost houses, to clear slums, and to make loans available to local authorities who build, lend, and manage the projects. Its purpose is to provide rental to substandard housing renters, making loans to 90 per cent and helping the local authorities to borrow the balance of the money.

John Ihlder, a Cornell graduate, told how reclamation of slums was proceeding in the District of Columbia. This authority supplements private enterprise, can borrow money for reclamation from Congress, redevelops slum property for the best possible use, and attempts to break even. New development is studying how projects fit into city planning and how to prevent the formation of new slums. Hugh Dryden concluded the round-table discussion with a summary of the contributions that the Bureau of Standards has made to technical knowledge of building and building materials.

The following M.I.T. men and guests thoroughly enjoyed the discussion and the subsequent dinner: master of ceremonies, John E. Burchard '23; guest speakers, Pierre Blouke '19, Miles L. Colean, Baird Snyder, 3d, '24, A. C. Shire, John Ihlder, and Hugh L. Dryden; also, William B. Poland '90, George E. Stratton '96, Proctor L. Dougherty '97, Benjamin A. Howes '97, Martin Boyle '98, W. Malcolm Corse '99, Henry C. Morris '00 and his guest D. E. Ragalie, Frederic W. Southworth '00 and guest John M. Billings, Charles H. Stratton '00, Paul Weeks '02, Amasa M. Holcombe '04, Frank W. Milliken '04 and guest Walter Junge, George H. Shaw '04, Ben E. Lindsly '05, Louis H. Tripp '06, Bion A. Bowman '09, Joseph C. Dort '09, and Edward D. Merrill '09 and guest Arthur Heaton.

Others were Kenneth P. Armstrong '10, Conor W. B. Coppinger '11, Charles P. Kerr '11, Frank L. Ahern '14 and guests Noland D. Mitchell and R. Kimball, Alfred E. Hanson '14, John C. Morse '14, Frank E. Richardson '16, Horace M. Baxter '17, William C. Mehaffey '17, Merritt P. Smith '19, George W. Anderson '20, Perry R. Taylor '21, Rudolf H. Blatter '22, George R. Hopkins '22, Carl A. Johnson '22, Lester C. Lewis '22, Robert K. Thulman '22, William K. MacMahon '22 and guest F. Rowe, Paul J. Culhane '23, Edmund S. Pomykala '23, Arne H. Ronka '23, William V. Cash '24, George D. Fife '24, Henry C. Hoar '25 and guest, Harry B. Swett '25, and William H. Hoar '26.

Still others were: John A. Plugge '29 with guest Donald E. Lane, Oliver G. Green '30, Mario V. Caputo '31, Henry E. Baratta '31, Patrick J. D. Harney '31, Henry D. Randall, Jr., '31 with guest A. L. Combs, John Vasta '31, Frederick M. Moss '32 and guest, Robert B. Follansbee '32, Burton H. Tower, George E. Wuestefeld '34, Hamilton H. Dow '35, Julian P. Perry '35, Karl H. Achterkirchen '35, Utley W. Smith '35, Arthur Riehl '35, J. Ross McKeever '36, Allen C. Stephens '36, Dee M. VanCott '36, John Lowe, 3d, '37, James A. Smith '39, and Richard L. Steiner '39.

The Society held its February meeting on Friday the sixteenth at 12:30 at the Cosmos Club assembly room. The new time and place were designed to afford an opportunity to those unable to attend night meetings to join with us in a luncheon. President Merrill introduced our Honorary Secretary, Henry D. Randall, Jr., who noted a number of newcomers, asking Stuart Godfrey '07, among others, to stand. This gesture, he explained, was because of the latter's infrequent recent attendance. Randall announced that the scholarship committee was anxious to receive names of students who might be interested in M.I.T. and might need financial help for next year. Amasa M. Holcombe '04 introduced his guest, Dr. Paynter of Harvard. Ed Merrill called on Harry L. Grant, chairman for the annual ladies' night, who told of the committee's plans for a high-class meeting in an accessible location on April 19. Grant announced that Robert E. Rogers, Professor of English at the Institute and otherwise known as Tubby, would be the principal speaker.

Our guest speaker, Victor K. Kwong, an attaché of the Chinese Embassy, discussed "China Today," with authentic predictions as to the outcome of the present struggle. Mr. Kwong, Boston University '27 and Harvard, proved to be an interesting and effective speaker, showing a complete knowledge of his subject and an ability to express himself in a delightful, easy, informal manner. It was most appropriate, he said, to be called upon to talk at this particular time, as the morning newspapers announcing Japan's latest move were bearing out strongly the thoughts he expressed with regard to the ultimate outcome in China. The Japanese army an-



nounced its plan to discontinue further territorial expansion and called upon General Chiang Kai-shek to surrender.

Admittedly, the Japanese army has control of the coastal cities and the railroads, but the hinterland to the west is in the hands of the Chinese government and will remain in its hands. This Chinese government operating from Chungking is functioning efficiently with a people united by a high morale. The Chinese army is two million strong with two million in reserve in training for the counter-offensive to come. It has good leadership.

China has not only moved its army to the interior but has moved its industries. Chungking is equipped with an airplane factory, a small arms factory capable of turning out light field pieces, and many other manufacturing plants. Many of the engineers running these new industries come from M.I.T. comprising students formerly sent here by China. They are supplying the engineering brains to put China on an industrial basis.

Kwong portrayed the United States and China as long-time friends whose friendship would not wane because they have so much in common. China never has been an aggressive country, as indicated by its long peaceful history. While the future is imponderable, Kwong hopes for the day when peace-loving countries will combine to assure a better world for all of us and our children and children's children, where "... on earth peace, good will to men" is more than a platitude.

The following M.I.T. men and guests enjoyed the excellent talk and the luncheon which preceded it: guest speaker Victor K. Kwong and guest Harvey Boyd; also, Granville H. Parks '87, George W. Stone '89, Frederick W. Swanton '90, Barron P. DuBois '92, George W. Stose '93, Walter I. Swanton '93, William H. McAlpine '96, Proctor L. Dougherty '97, Benjamin A. Howes '97, Frederick A. Hunnewell '97, Charles H. Godbold '98, Harry L. Grant '00, Henry C. Morris '00, Paul Weeks '02, Hewitt Crosby '03, Merton L. Emerson '04, Amasa M. Holcombe '04 with guests Dr. Paynter and Herbert C. Merrill '03, Ben E. Lindsly '05, Louis H. Tripp '06, and Stuart C. Godfrey '07.

Still others were Joseph C. Dort '09, Edward D. Merrill '09, David J. Gay, Chester K. Allen '17, Elijah Levi '17, Louis J. Grayson '19, Al F. O'Donnell '19, Larry W. Conant '21, Myer H. Naigles '21, Perry R. Taylor '21, William K. MacMahon '22, John H. Hinds '23, William V. Cash '24, John A. Plugge '29, Albert F. Bird '30, Patrick J. D. Harney '31, Charles E. Loucks '31, Henry D. Randall, Jr., '31, Arthur Riehl '35, Utley W. Smith '38, Joseph K.-H. Leung '39 and his guest, George F. Maddock. — WILLIAM K. MACMAHON '22, *Acting Secretary*, Rosslyn Gas Company, Arlington, Va.

### *Worcester County Alumni Association of the M.I.T.*

Sixty-five members and guests attended the annual winter dinner meeting at the Coronado Hotel, January 31. The special

guest was Charles M. Allen, professor and director of the Alden Hydraulic Laboratory of Worcester Polytechnic Institute, who discussed and demonstrated "Use and Abuse of Gasoline and Kerosene." Charles E. Locke '96, Alumni Secretary, brought greetings from the Faculty of M.I.T. and announced that this year's Alumni Day at Cambridge would be held on Monday, June 3, featuring "Communication," with emphasis on disseminating news stories and pictures.

Harold O. Berry '22 of Gardner, President, presided at a short business session and announced the appointment of the following committee for the annual ladies' night to be held in late April: F. Harold Daniels '11, chairman; Albert A. Gordon, 3d, '23, and Lewis S. Vose '16 of Worcester; Andrew B. Sherman '06 of Fitchburg; Roderic L. Bent '19 of Gardner; Edward Earl '91 and George W. Falk '32 of Leominster; Charles E. Allen '07 of Spencer; and Alanson G. Bowen '33 of Southbridge.

Frank C. Howard '17 of the Worcester Polytechnic Institute faculty was chairman of the committee on the winter dinner. He was aided by W. Sargent Crowell '32 and Robert H. Brown '22 of Fitchburg; Herbert L. Hayden '23 and Robert J. Proctor '28 of Leominster; Carl H. Wilson '34 of Southbridge; and Robert G. Clarke '35, Orville B. Denison '11, and John A. Swift '27, all of Worcester.

Other members present were H. F. Atwood '32 of Bolton; Joseph Goodwin '30 of Clinton; Fremont N. Turgeon '04 of East Brookfield; Fiske R. Jones '15 of Fitchburg; Ervin W. Berry '26, Ludwig P. Jandris '30, Thomas P. Kelly '18, and Roger R. Smith '27 of Gardner; Reginald G. Murdoch '34 of Grafton, Elmer E. Legge '18 of Leicester; Herman H. Hanson '39 of Millbury; Frederick E. Mader '32, Raymond W. Miller '31, Edgar W. Norton '98, and Robert S. Pride '29 of Shrewsbury; Arthur G. Anderson '30 and W. Franklin Baxter, Jr., '34 of Southbridge; George D. Manter '31 of Springfield; Frederic E. Banfield '07 and Philip B. Walker '07 of Whitinsville.

Also present were Erving G. Betts '18, Gordon W. Browne '29, Waldo E. Buck '76, Percy J. Colvin '07, Charles M. Dierksmier '37, Daniel P. Dyer, Jr., '32, G. Donald Fenton '35, Ralph F. Gow '25, Robert H. Haberstroh '31, William A. Hyde '04, Arthur W. Johnson '14, Albert D. King '32, Forrest F. Lange '23, Arthur J. Lariviere '35, Harry M. Latham '93, Myles Morgan '23, Roger M. Peirce '27, Leonard C. Peskin '29, Carleton A. Read '91, Percy M. Roope '27, John H. Sargent '37, John P. Vinti '27, and William A. Wilder '98, all of Worcester. — JOHN A. SWIFT '27, *Secretary*, 1156 Pleasant Street, Worcester, Mass.

## CLASS NOTES

1887

A letter from George Sever written the day after the blizzard of February 14 says: "This morning was spent in digging out after the heavy snowstorm. Drifts are

everywhere and some in unusual places and curious forms. My barometer went down to 29.30, and the wind blasts were of great force. It is the first time I have known the house to shake. But the sun is getting higher; spring is on the way; and the garden calls. So this hope springs eternal in the human chest." — Herb Wilcox comes gallantly (as usual) to the aid of the Secretary with the following newsy letter: "... I was, as you know, on a trip to Mexico, December 14 to January 12. Since getting home I have had a severe attack of the flu and was in bed most of the time for two weeks; have been so weak and no account since that I have done nothing, until the last few days, that did not seem absolutely necessary. In Mexico we made headquarters in Mexico City, taking the standard trips usually taken by tourists for one to four days at a time; went to a bull fight, and so on; regular tourist's routing. Went to the Carlsbad Caverns in New Mexico on our way home. They are indescribable, and I am not going to try to depict them. Thirty miles have been partially explored and the full extent is still unknown. Five miles of them are shown to visitors, under guides on foot, and one ends the trip by being taken 800 feet to the surface by elevator. ... — A letter just received from Mon Sturges says that he is much better, which the Class will be glad to learn. Wilcox has called on him several times as he lives about an hour's ride from Sturges' home in Santa Monica.

It was a source of great satisfaction to the Class to have gone through the past year without the announcement of any death among our members, but this feeling proved to be premature, for in January word was received of the death of John E. Kreps on September 29 in East Cleveland, Ohio. Kreps apparently faded out of the picture after his freshman year, and his classmates saw him no more. Possessed of a fine tenor voice, he furnished a pleasing musical combination with Gamble Latrobe at the football games in the rendering of the well-remembered college songs of those bygone days; Latrobe carried the air and Kreps furnished the accompanying yodel. Happy days, those! — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

Fred Ellis, the undefeated featherweight boxing champion of our four years at Tech, writes, referring to the class notes in the February issue of *The Review* concerning Tech *vs.* Harvard in athletic sports: "There is another exception when Technology was not the underdog to Harvard. At the open games held by the M.I.T. Athletic Club in the spring of 1888 there was boxing. I have a distinct recollection of Vic Cumnock, captain of the Harvard football team, with a water bucket, towel, and a featherweight from Harvard in one corner, and Henry Eastman with a water bucket, towel, and featherweight from M.I.T. in another corner. John Boyle O'Reilly was the referee. I have looked at the inscription

1888 Continued

on the top of the silver beer mug and I assure you that the winner in the featherweight class was NOT a Harvard man."

I immediately wrote Fred, accusing him of reading his own name on the top of the silver beer mug as the winner over the Harvard man, and as I have heard nothing further from Fred and knowing him to be one of the most modest men in the Class, I have reached the conclusion that he was the cause of another Tech victory over Harvard, with his terrific left-hand jabs to the chin.

Foster Ranlett, whose passing was mentioned in our notes in the last issue of *The Review*, was paid a fine tribute by Angus S. Macdonald, President of Sneed and Company, Jersey City, N.J., in a letter to Charles A. Ranlett, Foster's brother, as follows: "He had been in charge of our structural-engineering work for over thirty-five years and in that time had engineered many important book-stack structures, including those for such notable buildings as the New York Public Library, Library of Congress at Washington, the Harvard, Yale, Illinois, and Vatican libraries. In this work he showed a great deal of understanding of broad engineering principles, as well as ingenuity and resourcefulness. His very fine lovable character endeared him to all his associates. His courage and optimism in the face of his terrible affliction won everyone's admiration. Right up to the last he constantly planned to return to the responsibilities and work which he loved. We miss him greatly."

John Runkle, mourned as lost from Cambridge, showed up as a resident of Prescott Street during the winter, and invited the Secretary to a dinner meeting of the Alumni Council, of which he has been a member for eight years. Talks by Dean Prescott '94 and members of his staff of the Department of Biology and Public Health were most interesting.

For the benefit of his grandchildren in various parts of the country, the Secretary is writing yarns of his days afloat when he was in command of the steamer *Cadet* in 1893 with thirty-five Technology students and crew on her trip to the first Chicago World's Fair; also of his five months on the U.S.S. *Scorpion* in 1898 on the south coast of Cuba during the Spanish-American War, and when he was captain of the naval reserve ship U.S.S. *Dorothea* on her voyage from Philadelphia to Chicago by way of the Gulf of St. Lawrence in 1901. These yarns are not exactly bedtime stories, but the Secretary hopes they will be of some interest to the children, as they include naval fights, shipwrecks, and so on. — BERTRAND R. T. COLLINS, *Secretary*, 16 Chauncy Street, Cambridge, Mass.

## 1889

Zenas Bliss went to Texas for the last part of the winter, probably to keep an eye on Cactus Jack. — Paul Hawkins wrote that he retired from business on August 1. The Secretary hopes that now Paul will be able to come to the class dinners more often. — Alfred Hoyt

Granger, long a prominent Chicago architect, died at his home in Roxbury, Conn., on December 3. He was a great-nephew of General W. T. Sherman and John Sherman. His firm designed the La-Salle Street Station and many other important buildings, and about 1933 he wrote a guidebook to Chicago restaurants. The book was similar to those sold in Paris. During the World War he was chairman of a construction committee for the War Industries Board. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

## 1891

A class dinner was held at the Algonquin Club, Boston, on the evening of January 26. The following were present: Holmes, Smith, Fiske, Rogers, Bowen, Damon, Punchard, Ryder, Forbes, Clark, Brown, Dana, Young, Wilder, and Bradlee. A number sent their regrets and best wishes, including Wilson, Earl, Jere Campbell, Moore, Swan, Blanchard, Hopton, Colburn, and White. Billy Dart expected to come but couldn't make it. Ed Smith took his place as representative of Rhode Island. The night before, Smith and Fiske had been at the Technology Club of Rhode Island party (attended by some fifty in all) which included dinner at the University Club and attendance at the Ice Follies at the Rhode Island Auditorium in Providence.

Walker has been at Winter Park, Fla., for the winter; White, at St. Petersburg; and Ambrose, at Ormond. At this writing, the temperature in Florida is around freezing! — Fred Blanchard had to go back to the hospital for three months but is out again and went to Florida about February 1 to recuperate. Jim Swan has been at a hospital in Washington for an eye operation but is out again.

Gif Thompson is now living at 152 Harvard Street, Brookline, regaining his health after a serious setback. He is living in an apartment where he has good care, and he gets out a little but cannot walk far, as he has little strength. Your Secretary had a nice call there and reminisced even to childhood days. Gif's memory is prodigious. He is glad to have callers.

Barney Capen wanted to come to the dinner but of course should not have tried to make it in his present condition. We all talked to him over the phone to cheer him up. — F. Clouston Moore came to Boston frequently before he left to spend this winter in Tucson, Ariz. — Steve Bowen and Lin Damon left for Havana about February 1 on a United Fruit boat. They looked up Charlie Ricker, who is living there this winter, and a postal from Steve reads: "Perfect weather. Ricker giving us a wonderful time. His address is Cia Cubana de Electricidad, Havana, P. O. Box 1715." — We missed George Vaillant at the dinner. His wife died recently, and we extend to him our sincere sympathy.

Most of our party were looking very fit, especially our host, Harry Young, who made the arrangements, including a fine dinner and "accessories." Harry Bradlee omitted his speech, as usual, but

made up for it by inviting us to The Country Club, Brookline, for our summer outing in June. We will be there! Then we discussed our fiftieth, which comes next year, and the consensus seemed to favor the Corinthian Yacht Club at Marblehead, if Lin Damon can make arrangements for us. The Class of '96 have reserved East Bay Lodge for the dates we want, and some of the better hotels are already spoken for on that particular date, but of course our needs should have preferred treatment on our fiftieth! It looks as if we should still be going strong, with about 135 now on our records. Out of a total of 326 whose names were on our list originally, about 190 have died or their addresses are unknown.

Following our dinner, Gorham Dana showed us some colored movies of our forty-fifth and of our outing at The Country Club of Brookline last summer. They were very interesting, and some were remarkably good. The forty-fifth pictures apparently were taken by Charlie Aiken and just came to light. Most of us had never seen how we looked in colored movies, and the likenesses seemed better than in black and white, although some faces showed too much color to be altogether natural. Later, Gorham showed some colored movies of hummingbirds, taken at his summer home in New Hampshire. He was able to tame them so they would eat out of tubes held in the mouth or hand. Slow motion showed them fluttering their wings and flying backward. Who else has some interesting movies to add to our enjoyment?

Walter Hopton wrote recently, chiefly regarding the fiftieth anniversary of the Phi Beta Epsilon Fraternity which comes this year. Most of the founders were '91 men. We were juniors at the time and it is hard to realize that fifty years have gone by. Freddie Cole, one of the founders, is still living in Rochester, and we will try to dig him out of his shell for both the fraternity and class celebrations.

The following letter is from Charlie Garrison to Barney: "Here we are, making Marg a ten days' visit. Just before, we spent several days with Bob in his new house at San Marino. He helped Fan Carrel choose a new Buick car in which we have been traveling. I drove it here, and the following table gives a comparison with our last trip. (Secretary's note: Charlie details his trips to the *n*th degree and shows seven minutes' gain with the new car, or about 3 per cent.) We had some showers on the way up; in fact, it has been unsettled most of the time here. Yesterday Ernest Hersam took me to the Commonwealth Club at San Francisco for lunch and to hear Graham Stuart lecture on 'Must the United States Have a New Foreign Policy?' It was a very interesting occasion and was widely broadcast; perhaps you heard it. Then Ernest drove me to the Golden Gate Park and to Lincoln Park. We stopped at the Palace of the Legion of Honor, drove through the Presidio — saw fine waves and view of the Golden Gate Bridge. Passed through Fisherman's Wharf and back of the San Francisco-Oakland Bay Bridge to Berke-



1891 Continued

ley. He dined with us at the Woman's Faculty Club. We stay in Marg's apartment, and Fan is at the Faculty Club. We plan to . . . stop a few days at Carmel. There has been quite a little rain up and down the coast, and from Santa Barbara to Santa Monica the heavy seas have washed away the shore and many summer houses. Where we lived at Long Beach on the peninsula, the water came way across into the bay. With the high tides and the strong currents, the water front crumbles.

"I hope you have been comfortable during the cold spells. I think I wrote you how Margy's sister-in-law, coming from Boston recently by auto with an experienced driver, struck some icy road, causing the car to turn over. The three occupants were with their feet in the air! Fortunately, no one was hurt. More recently, my brother Billy's wife and daughter had their car turn over in Virginia while they were on their way to California! Quite an unpleasant epidemic in the family.

"Spring will soon be with you and I suppose more of the boys will be passing by the Assistant Secretary's house and stopping. I should like to be one of them. . . ."

The following changes in address have been received: Arthur N. Mansfield, Batchelder, Whittemore Coal Company, 834 Massachusetts Avenue, Boston, Mass.; Harmon Wendell, 1261 Pennsylvania Avenue, Detroit, Mich. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I. — BARNARD CAPEN, *Assistant Secretary*, Early Convalescent Home, Cohasset, Mass.

## 1895

The next reunion of the Class will be its forty-fifth and will be held at the New Ocean House, Swampscott, Mass., on Saturday and Sunday, June 1 and 2. This beautiful site, bordering the Atlantic Ocean, provides proximity to Cambridge and Boston and offers all the comforts and conveniences which contribute so much to a perfect reunion. A general questionnaire has been mailed to the class membership, requesting specific information for reunion purposes, and this item is to remind those who have failed to reply to do so at once. The passing years have taken their toll of good fellows; therefore it behooves the remainder of the clan to get together whenever possible to renew friendships.

Through the press, we learned of the passing of George Shattuck Whiteside, on January 29, at his residence at 1212 Fifth Avenue, New York City. Whiteside was with the Class during the years 1892-1893, in the chemical course, and was known intimately to many members of the Class. Dr. Whiteside was a native of Boston, a graduate of Harvard College and its medical school, where he taught anatomy. He also served on the staff of the Boston Dispensary. In 1912 he was examiner for the New England Life Insurance Company and later was surgeon for the Winchester Arms Company at New Haven, Conn., and for the Travelers In-

surance Company at Pittsburgh, Pa. Dr. Whiteside was a member of the Harvard Club, Boston, and a fellow in the American Medical Association. He was a well-known surgeon and in later years practiced in New York City.

On January 29, Franklin Thomas Miller, XIII, died at his home in Auburndale, Mass. Frank Miller was well known to many of the class members. Following graduation to 1918 he was in the publishing business, successively as secretary, treasurer, and president of the F. W. Dodge Company. During the World War he served as member of the committee of national defense, United States Chamber of Commerce. He was chairman of the board of the Architectural Record Company, Record and Guide Company, and American Contractor Publishing Company. His wife Lois Mabel (Sawyer) Miller and son Richard Franklin Miller '34 survive him.

By letter recently we learned of the death of James C. Hopkins, IV, on November 11, 1938. Hopkins was a member of the firm of Kilham, Hopkins and Greely, architects, 126 Newbury Street, Boston, Mass. This firm designed and executed a great variety of important work throughout New England. — Francois E. Matthes (the other twin) may now be found with the United States Geological Survey in Washington, D.C. — Watson E. Goodyear has moved to 133 Bunker Hill Avenue, Waterbury, Conn. — Ernest S. MacGowan is now at 4112 Colfax Avenue, South Minneapolis, Minn. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

## 1896

It is a pleasure to report that the note in the February issue about the return of mail addressed to Reg Norris in France marked "deceased" was very misleading. Arthur Baldwin has looked into the matter thoroughly and has written the Secretary that Reg is very much alive, which news is certainly good. A note in the March Review was also in error. The Secretary was able to get in touch with Sanderson, and learned that it was Sanderson's brother and not Sandy himself who was the author of the recent book covering the history of Waltham.

The Boston *Globe* of Thursday, February 22, contained a picture of Ralph Henry looking at an old cannon ball, weighing five pounds, which was unearthed 12 feet below the surface during excavation for the publicity housing project for which Henry and Richmond are architects. According to the story which accompanied the picture, the discovery of this cannon ball prompted Ralph to delve into history, and he has reached the conclusion that it lay in direct line with George Washington's Dorchester Heights entrenchment and the harbor position of the British ships in the Revolution; it is quite possible that this round shot might have been fired at George Washington, 164 years ago, and

missed him. It was found in the peat substratum close by the tops of some oak piles of the old wharf at what was then the harbor edge.

Herbert Newell has written from Palo Alto, Calif., where he is now living with his son, although he still maintains a permanent legal address in Portland, Ore. He retired from active work about ten years ago and says that he is a ticket-of-leave man who may be found anywhere west of the Rockies. He reports that he has gained a few pounds in weight since the beginning of the century, and what hair he still retains has been gray for a long period. His son Herbert, Jr., is studying at the Stanford Law School.

Joe Pillsbury, who is Workmen's Compensation Board commissioner in Vancouver, British Columbia, is a busy man administering the Workmen's Compensation Act, the Old Age Pensions Act, and the Boiler Inspection and Electrical Inspection acts in the province of British Columbia. All basic industries come under the Workmen's Compensation Act, which is administered by the board, and the board serves as a court of final action from which there is no appeal.

Richard Elliot, who is president of the Thomaston National Bank in Thomaston, Maine, says that he is very busy for a man sixty-seven years of age, putting in full time at the bank every day throughout the year, except for short vacations in the spring and fall for hunting and fishing, going to Eustis, Maine, and then nine miles into the big woods. The last time the Secretary saw Elliot, some years ago, he was about the youngest-looking man of the Class.

The location of Mrs. Marion Lewis Lee on Memorial Drive in Cambridge this winter gives the Secretary the pleasure of frequent contacts with her. She possesses still her characteristic trait of persistency for getting her objective. The story that she tells of how she finally secured the ironwork grille from the rear of the old Walker Building on Boylston Street is most interesting. She had to approach one person after another, and at one time seemed to be absolutely up against a stone wall, but she finally got her grille for M.I.T.

On Tuesday, February 13, under the leadership of Admiral Bakenhus, seven classmates got together for dinner at the New York Athletic Club in New York City. The gang included Bakenhus, Gaylord Hall, Melluish, Ruckgaber, Sager, Tilley, and the Secretary. The party lasted until midnight and was a very fine affair. Various news items were brought out: Charlie Hyde was reported to have been elected a director of the American Society of Civil Engineers for a three-year term beginning in January. Hall's associates in the Interborough Company had recently given him a birthday party to observe the fortieth anniversary of his service with the organization. It was an absolute surprise to him, and it is a coincidence that ninety-six people were present. Ruckgaber had recently returned from a trip of one-and-a-half years abroad to all parts of Europe, Egypt, and other places. Bill

## 1896 Continued

Dorrance had expected to come to the party from New Haven but at the last minute had to go on to Boston that day. Regrets were also received from Julius Gayler, Rutherford, Charlie Lawrence, Freedman, and others who, because of previous engagements or for other reasons, were unable to be present. Fred Andrew was on a trip to Florida; Russell Starr likewise was in Florida. Ed Sturtevant, who travels for Frosted Foods Sales, Inc., was on a southern sales trip.

It looks as if the Class were getting soft and unable to stand the rigors of the northern winter, having to go south. In addition to those just mentioned, the M. L. Fullers were in Eau Gallie for the winter; Charlie Nevin with Mrs. Nevin, in Winter Park; the Clark Holbrooks, at Miami; the Con Youngs, at Fort Myers; Clarence Perley, at St. Petersburg; Charlie Moat, somewhere in Florida for the month of February. A letter received from Jacobs early in February was postmarked New Orleans, but the contents gave no clue to what he was doing down south at that time away from his regular school duties in Vermont.

Although Clarence Perley has retired from his former position in the Library of Congress in Washington, he maintains his interest in the library and has matters which keep him busy, owing to his appointment as honorary consultant in classifications. Since 1937 he has also been employed by the American Library Association in co-operative cataloguing and classification at the Library of Congress. He is more or less of a free lance and is therefore able to spend a mid-winter vacation period in Florida. His daughter and her husband are now located in Washington and make a home for Perley there. Harry Tozier, who is with the Eastman Kodak Company in Toronto, took his vacation last summer in the form of a trip to the Yellowstone National Park, and at the meeting of the Toronto Technology Club on December 12 he showed several reels of the Kodachrome pictures which he took on that trip. Partridge, who is recuperating at New England Camp, Brunswick, Ga., has his trailer, which is well built, well insulated, and well heated by his oil stove, so that he is perfectly comfortable inside with his little dog and can thumb his nose metaphorically to the cold whenever a blast from the North descends upon Georgia. — Lloyd Wayne in Indianapolis is still tough and can take it. In a recent note to the Secretary he just chuckled over the plight of the poor people who went south to Florida and other places this winter. He says he tried it out a year ago and has learned his lesson, so that henceforth Indianapolis in the winter is good enough for him.

John H. Houghton died on December 21, 1938, according to the report recently received. He was here with us only during his freshman year and did not maintain any connection with the Class. He had been located in Westfield, N.J., for some time with the occupation of economy engineer, but for many years prior to 1925 he was with the Union Bag and Paper

Company in Hudson Falls, N.Y. He was born September 6, 1873, in East Boston, Mass., the son of Edmund W. Houghton.

Andrew H. Green died on December 29. He received his degree of S.B. in Course I at M.I.T. in 1896, subsequent to the degree of B.A. at Harvard in 1892. Green was well known to many of us. For a while after graduation he followed industrial lines in Chicago, but for many years he had been a planter at Canefield, Dominica, B.W.I. Green made fairly frequent trips to the United States and to Europe. He had always hoped that in going to New York and Chicago on these trips he might get to Boston and might even participate in some class meeting or five-year reunion, but he never succeeded in doing so. He was born on November 7, 1869, in Chicago, Ill., the son of Oliver Bourne and Emily Louis Green. — CHARLES E. LOCKE, *Secretary*, Room 8-219, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1897

As regards the matter of a general reunion of the Class, the Acting Secretary realizes that this was taken up at the fortieth reunion and that Irene du Pont made a motion that we hold a reunion, similar to the fortieth, every year instead of at five-year intervals, and that a committee was appointed to consider the matter. Owing to certain obstacles, nothing came of the suggestion, but it seems as if this would be a fitting year to have such a reunion. It has been the custom of the Class, in the spring of each year, to hold in Boston a dinner which included the wives and children. I suggest that we might have the meeting in New York every other year, New York and its surroundings being a popular area where most everyone has relatives or friends. It is possible that we could take in the New York World's Fair and then have a rousing dinner at some appropriate place, the idea being to go over on a Friday by automobile, take in the Fair on Saturday, and have the dinner Saturday night. Jere Daniell's offer (farther on in these notes) is certainly a delightful suggestion and worthy of consideration. A rather large, more elaborate reunion about halfway between Boston and New York is another consideration.

In connection with such a reunion, however, the work and money necessary must be given careful thought. We have members who are glad to toss in once in five years, but to toss in every year is another thing. If I remember correctly, on all of these occasions the amount charged is almost 50 per cent of the actual cost. I will call the matter to the attention of the executive committee.

We congratulate Technology and H. E. Worcester for the latter's presidency of the Alumni Association for the calendar year beginning in July. — F. E. Bragg of Bangor, Maine, is well and sends his best to the Class. — Charles N. Haskins of Lebanon, N.H., writes that he is alive and kicking — very much opposed to the political administration and hopes for

relief the coming year. — John Howland writes: "After thirty years of service with the National Board of Fire Underwriters as a fire insurance engineer, I retired on December 31, 1938. Am now living the life of Riley in a most comfortable old homestead of the Cape Cod style of architecture, on a two-acre plot of ground, containing thirty fine old apple trees, plenty of room for truck and flower gardening and driveways. The latter have kept me very busy the past two weeks, removing the snow. My good wife and I find this dry, bracing air at about 1,400-foot elevation here in the hills of New London, N.H., a delightful spot. . . ."

Jere Daniell writes from Franklin, N.H.: "I spend a good deal of my time up at my farm here in Franklin while the weather is good, but most of my winter passes at New London, Conn., where I spent so many years working for the Electric Boat Company, designing submarines for the United States and other navies. Have just settled down to be one of the 'Nine Old Men' of the hotel, a retired British army officer at his London club. Run down to New York now and then or up to Boston on business or pleasure. See a few good shows, attend banquets of various societies, and make myself as thoroughly useless as is humanly possible. My family (my brothers, I mean, for I have none of my own) are all off during the winter to Florida, California, or Puerto Rico, where I have a nephew in the sugar business, leaving me alone to enjoy our good New England climate. Just now I am snowed in up here in Franklin at my cousin's house. . . ."

"How about arranging for a class reunion this year at my place here — fine boating and bathing and very handy for trips up into the mountains. Let's think it over. No cost except to provide the grub stake. Looks good to me. Hopkins will tell you all about it. Could put up a dozen overnight easily."

Referring to the recent death of Hugh Kelsea Moore, the following resolutions were passed by the executive committee, and a copy sent to Mrs. Moore: "Whereas in the wisdom of Almighty God, our Classmate Hugh Kelsea Moore has been called to realms above as of December 18, 1939, in the sixty-eighth year of his life, and whereas Hugh Kelsea Moore was throughout his life one of the staunch and loyal and enthusiastic members and supporters of the Class of 1897 of the Massachusetts Institute of Technology, and whereas through his accomplishments in the realms of industrial research and scientific invention and the wide professional recognition of his services, he brought unusual honor not only to himself, but to the Class of 1897. Therefore, be it resolved that we, the Executive Committee of the Class of 1897, do hereby acknowledge and express that in his death his Classmates have realized not only a sincere sense of grief and sorrow, but also have suffered an irreparable loss. And be it further resolved that these resolutions be duly spread upon the records of the Class and that a copy of the same be transmitted to his family."



We were glad to hear from Dougherty, who writes: "... I am acting as a consultant in the attempt to aid hungry manufacturers and companies desiring to do business with the Federal government on an intelligent basis. Since retiring from the district commissionership in 1930, I have been reasonably successful along this professional line. I modestly report re-election as a member of the board of governors of the University Club of Washington. It is quite remarkable that now that our Class is in the old-age zone, a few of us meet at the regular monthly meetings of the Washington Society of the M.I.T. These '97 men include Henry M. Loomis, Assistant Secretary of the National Canners' Association; F. A. Hunnewell, commander and chief constructor, United States Coast Guard Service; Benjamin A. Howes, chief, materials and specifications section, technical division, United States Housing Authority. Bernard Barrows, assistant chief, division 23, United States Patent Office, is a long-time Washingtonian who does not honor the local Society with his presence."

Proctor says also that a recent reorganization, directed by the President, consolidated the United States Coast Guard and the Lighthouse Service, and the responsibilities of F. A. Hunnewell were increased thereby. Commander Hunnewell is chief constructor of the Coast Guard and, since the consolidation, the Coast Guard fleet now comprises some three hundred cruising cutters, harbor cutters, patrol boats, tenders, and light vessels, together with about four thousand motorboats, sailboats, and rowboats of various classes. Hunnewell is actively engaged in the endeavor to obtain the economy and efficiency of the fleet anticipated by the reorganization, and maintenance problems are of increasing importance. As a result of the severe ice conditions along the North Atlantic Coast during the past winter, special attention is being paid to new designs for icebreakers. ... There is an increasing demand by communities concerned that the Coast Guard shall open up icebound channels for commercial traffic, and it is proposed to render this service as far as practicable. As a matter of fact, Hunnewell reports the duties assigned to the Coast Guard are continually increasing, and the work relating to the construction and repair of the fleet is correspondingly more arduous.

We are all glad to hear that Tom Atwood is improving rapidly from his long illness. He is pulling himself together, and I am sure we will all pull for him. Tom is one of the best, and we know he will keep his chin up. — Tom Weymouth, Vice-President of the Columbia Gas and Electric Corporation, writes: "I unfortunately see very little of the class members here, in spite of the fact that New York is a more or less central point through which many of them pass. Jack Ilsley drops in occasionally, and about once a year I see Charlie Dunn of Lock Haven, Pa., who, as you may know, has devoted a great deal of time to cultivating

the 'Rustica' plant and has developed a form of it with an extremely high nicotine content which is valuable both as an insecticide and as a worm remedy for animals and chickens. This, I believe, is what he spends his money on, although his major occupation is that of associate judge, a job which I understand he is handling very ably.

"The man I see most here in New York is George Wadleigh, with whom I have luncheon frequently; he seems to be the best-informed man on our class affairs. The other evening he gathered together Parsons, Pope, and myself to have dinner at the Union League Club with Harry Worcester, who was here overnight. We had a delightful dinner together. At our last reunion, I indulged in my photographic hobby, as you may remember, and secured some excellent shots of the various fellows, but have been too lazy to make the prints to send out to them. Some of these days I expect to do this. ... I wish that it might be possible for us to get together again before the time for the forty-fifth reunion, and this year should be a good one to do it."

Frank Preston of Springfield, Mass., writes that his principal difficulty since the hurricane is what to do with down timber which he owns in New Ipswich, N.H. He had his camp cleared and has about five thousand feet of fine pine lumber, some of it 17 inches wide, but there is no market for it. Preston is practically retired and shows up at the bank only about one day a week. He says that he sees John Howland each summer in New London, N.H., and also sees Albert Norris in New Ipswich occasionally. — Alfred Hamilton is the proud grandfather of two granddaughters, aged seven and eight years. Hamilton is an insurance broker at 60 East 42d Street, New York City.

I regret to announce the death of William O. Sawtelle on September 23. I had hoped to give more details and expected to hear from Arthur Hopkins, who has a friend who was very intimate with Sawtelle. Arthur at that time was not feeling up to scratch, was recuperating in Newton Center, and was going from there to Wellfleet. Unquestionably he has not been well enough to get in touch with his friend. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 30 Kilby Street, Boston, Mass.

#### 1899

From North, South, East, and West come tales of snow and gales, but particularly from the Deep South, Atlanta, Ga., C. A. Smith writes of the headaches Old Man Winter brought to transportation fields. Atlanta experienced several days of zero weather, not to mention one snowfall of ten plus inches in January, followed by another in February, not so deep but deep enough. Southland snow does not usually require plows for removal because the sun takes a hand, but this year the Deep South had to dig out with the rest of the country — it's news when Atlanta has to use a snowplow. After

#### THE TECHNOLOGY REVIEW

moving the snow Smith planned a jaunt to Florida, where he hoped to do a little fishing. It is to be hoped that he met Norman Rood, who planned a month or more at Naples with nothing to do but eat, sleep, and fish.

S. B. Robertson is at Delray Beach. I've besought him to pen me a tale. — W. E. Parker resides permanently in Fort Lauderdale in an electrified house. He used to chart the ocean floor and should know how to tell a tale. — Harold Smithwick passed through St. Petersburg, Fla. From the postmark on the envelope in which he mailed class dues I checked up on his jauntings. They say money talks; perhaps he depended on the check to spread glad tidings. — I went down myself in March and tried to bring back a fish story of my own.

Before C. A. Smith went to Florida he wrote that he had done considerable committee work with the American Transit Engineering Association, and that Walter Allen of the Boston Elevated was elected president last year. — C. E. Smith, who started with '99 but finished with the Class of 1900, is now vice-president in charge of purchases of the New York, New Haven and Hartford Railroad. — Harry Keys, who used to carry the flag in the freshman battalion, retired from Bell Telephone two years ago and spends much time in sunny Florida. — Allen Loomis claims, by letter from Elkhart, Ind., that he can contribute no news; in the next sentence he says he has seven grandchildren!

Right here is a good place to mention the reunion, which is to be held at the Essex Country Club, Manchester, Mass. (near Boston), June 1 and 2. Those attending can plan to be present at Alumni Day in Cambridge on Monday, June 3. Come one, come all; but let me hear from you, at least tentatively, so we can engage some space. Arthur Hamilton will run the publicity again this year.

From Stark Newell, Bath, Maine, comes a vote for the reunion and the news that he is still building ships for Uncle Sam. He has twelve M.I.T. men on his staff. In addition to his shipbuilding, I find he is president of a savings bank, a water utilities company, and a towboat company. — Ralph Loud of Arlington, Mass., is all for the reunion and plans to be present, having been denied that pleasure last year because of a serious illness from which he had not sufficiently recovered. Like all the rest of the Class, Loud feels that his work is not news — he continues with the sewerage division of the Metropolitan District Commission (a state commission) for the construction and operation of main trunk sewers in the Greater Boston area, and he occupies the post of associate civil engineer.

E. F. Samuels writes from Baltimore, Md., of his New England vacation. He makes his headquarters at Center Sandwich, N.H., and last summer he and Mrs. Samuels did a bit of mountain climbing, including Kearsarge, White Face, Chocorua, Southern Kearsarge, and ending up with Mount Washington. He'd like to compare notes with anyone else who has

1899 Continued

climbed the roof of New England. — Lew Emery, who has been quite ill for the last couple of years, writes of improved health. From Atlantic City he, too, commented on the vagaries of the weather. — Arthur Foote of Grass Valley, Calif., has announced the marriage of his daughter Janet to John Abbott Titcomb on February 3. — It is with regret that I announce the death of W. C. Belcher, Holbrook, Mass., in 1938. Harold E. Howard died in July, and Philip Stockton on February 11. At the time of his death Stockton was chairman of the First National Bank, Boston, Mass. He was a life member of M.I.T. Corporation and served as director of more than thirty corporations. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, N.W., Washington, D.C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

## 1900

Russell Suter sent in the following clipping from Kingston, N.Y.: "Lewen F. Searle, who since 1931 has been principal assistant engineer of the Catskill-Croton Division of the New York City water supply system, died . . . at his home, 26 Mountain View Avenue, following a short illness. . . . Born at Lawrence, Mass., October 11, 1876, he was . . . connected with the engineering staff of the New York Central Railroad for a time. With the development of the Catskill water system by the city of New York, he severed his connections with the railroad and in 1906 took a position with the Board of Water Supply of the city of New York as an engineer on the Ashokan project. He was engaged in the preliminary surveys and estimates . . . and during the entire construction period he was in charge of the preparation of all contracts and estimates for the numerous reservoir contracts. On completion of the Esopus development he continued on the Schoharie works. . . .

"Mr. Searle entered the services of the Department of Water Supply, Gas and Electricity in 1926, being transferred from the Board of Water Supply which has charge of construction work for the department. . . . His familiarity with the Ashokan and Gilboa reservoir systems which he saw grow from a plan on paper to the completed job was most complete. . . . Mr. Searle was an associate member of the American Society of Civil Engineers. . . . Mr. Searle is survived by his wife who was Anna Buddington, a daughter, Margaret S. Robinson, who resides in the Philippine Islands, his father, Josiah Searle of Minneapolis, Minn., and one sister, Mrs. H. K. Painter, of Minneapolis, Minn."

Many thanks to Jim Batcheller for the package of nice prunes from his own trees. His letter follows: ". . . The motivating impulse to write finally sparked when I read Allen's account of his motor cruise, and it appears he may have motored through Corvallis, on U.S. 99W, or within ten miles if on 99E. I was sorry I did not see him or know of his trip in time to offer him information. . . . I am delighted indeed he was so discriminating

in his tastes and so complimentary to Oregon scenery, viz., the Columbia Gorge, the Oregon Coast Highway, and Crater Lake. Also, it was a relief to find he had these places correctly located geographically! . . . Allen, the next western trip you or any other 1900 men make, let me contribute some suggestions to help you get the fullest possible enjoyment out of your journey. . . .

"To go back to Alumni Day and Commencement: At 2:00 P.M. on June 6 (after leaving Symphony Hall), I started west by motor with an Oregon boy friend as a driving companion, and reached Corvallis in five and a half days. I had to hurry in order to get here in time to see my third son married. On June 27 I met Bob Leach in Seattle, where we embarked on the S.S. *Denali* and sailed for Alaska. As we were strictly on the loose, . . . we could relax and enjoy ourselves. . . . At the table and on deck we met . . . a pleasant cross section of Americans off for a good time. Some of them were making the same trip we were, namely, the downstream Yukon-Circle tour, and we were thrown together for over three weeks.

"For those who are not familiar with the geography of Alaska, I should explain this tour takes one to Skagway by boat; over White Pass to Whitehorse on the upper waters of Thirty Mile River by White Pass and Yukon railroad; thence by stern-wheel river steamer down the Thirty Mile into Lake Labarge and on into the Yukon River. . . . At Dawson some new big gold dredges are doing so well that a measure of prosperity is returning to the city, which is not such a ghost town as it recently was. From Dawson the steamer continues down the river past Circle City and Fort Yukon to the junction of the Tanana River, thence up the Tanana to Nenana. From this debarking point, one has to take the United States government railroad to Fairbanks and thence to Seward (a two-day trip) on the southwestern coast. Here one resumes the ocean voyage again, returning to Seattle via Juneau, Sitka, and Ketchikan. We varied this routine slightly by leaving the Yukon boat at Circle City . . . and motored over the new United States government-built Steese Highway to Circle Hot Springs Hotel. . . . We were only sixty-odd miles south of the Arctic Circle, and it was the midnight of July 7-8. Needless to say, it does not get dark in the so-called night during the summer. . . . One never knows when to go to bed. . . . The prolonged sunlight, twenty-one hours in Fairbanks, makes it pretty warm, really *hot* at times. Most people find it so hard to go to sleep in broad daylight at 10:00 P.M. that there is a temptation to pull down the curtains, but then it becomes suffocatingly warm in one's bedroom. The best solution is to buy a pair of black silk blinders (little soft pads that fit in the eye sockets), held in place by an elastic band around the head, and use them for shutting out the light with curtains up and fresh air coming in. This recommendation isn't any fairy tale. Call up Warren Mead, Head of M.I.T.'s Department of Geology, whom we met up

there and who showed us his! This prolonged daylight has an astonishing effect on the growth of vegetation, for though the actual number of weeks of growth may be short, everything grows for twenty-four hours a day! It has some curious results, however. While most of the flowers of the temperate zone will flourish out of doors (if started indoors and then put out after the last frosts), there are some that 'can't take it.' For example, the common sunflower grows splendidly until its buds open up, when it then develops weak stems as the blossoms wring their necks off following the sun around day after day!

"We were sorry we could not take time to fly to Nome and Point Barrow — for there is excellent and extensive air service all over the Territory — to see something of Eskimo life. Few people from the States appreciate the cleverness and resourceful ingenuity of these highly intelligent, though primitive, people. Through many centuries of struggle for bare existence itself under most difficult climatic conditions, they have developed many highly efficient techniques. In hunting, for example, it is well known that, disguised in sealskins, an Eskimo can crawl to windward over the ice and get close enough to a live seal to stab it with a knife. They are also clever at developing new technique, suggested by what they observe of the white man's ways, food, clothing, equipment, and so on. . . . The latest example is their new way of catching Arctic hares. An Eskimo will powder his parka with snow, so that when he squats down, out in the open, he looks like any hummock of snow. By keeping absolutely quiet, hares will disregard him and come around out of hiding. Then, when he makes a noise like a carrot, they'll come close enough for him to catch them by hand! They are a remarkable race of people. I cannot begin to do justice to the interests of our trip. . . .

"Out here our *coldest* thus far during the winter was 27 degrees for a few hours one night. Only seven different nights have gone below 32 degrees Fahrenheit! We feel our spring is here, for the pussy willows are out on my place and my first crocus appeared yesterday. Violets and winter jessamine have been in bloom since early December! . . . I have an orchard of about ninety Italian prunes and fifteen apple trees. Fruit is so abundant out here, it is almost impossible to sell it or even give it away locally. The best way to prepare the prunes for eating is to soak overnight in sherry (or whatever you prefer) to soften a bit and make more easy the removal of the pits. Then replace the pit with walnut meat, pecan, or what have you; pinch together; and roll in powdered sugar. . . . I am mighty sorry I'll be on duty, I fear, at the time of the fortieth class reunion; so it does not now look as though I'll be able to attend. Kindest regards to you and all other classmates."

Here are some addresses which have changed since the list was sent out to all class members recently: Harry C. Hanson, 119 Magnolia Street, Dorchester,

*You will find on page I information on Alumni Day, June 3*



## 1900 Continued

Mass.; Edward G. Gallagher, 205 North Maple Street, Florence, Mass.; C. C. Brown, Bell Telephone Company of Pennsylvania, 1835 Arch Street, Philadelphia, Pa.; S. M. Hall, Stephen Hall and Company, Inc., 7th and Adams Streets, Hoboken, N.J.; A. I. Kendall, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, Ill.; Thomas D. Perry, 361 West Second Street, Moorestown, N.J.; George H. Belknap, 48 Blomert Street, Malden, Mass.; Charles M. Carpenter, 2700 South Cedar Street, Lansing, Mich.; Walter C. Chaffee, 731 South Altadena, Royal Oak, Mich.; Franklin N. Conant, 339 Marlborough Street, Boston, Mass.; Louis N. Gowell, 523 Crafts Street, West Newton, Mass.; Lieutenant Colonel Milton W. Hall, Fort Sheridan, Ill.; Harry E. Osgood, 122 Chestnut Street, Springfield, Mass.; William C. Pickersgill, 69 Erie Avenue, Newton Highlands, Mass.; Edmund H. Pitcher, Keene Screen and Awning Company, 28 Woodburn Street, Keene, N.H.; Walter L. Rapp, 1100 Times Star Tower, Cincinnati, Ohio; Percival E. True, 378 St. Charles Street, Elgin, Ill.; Frederick D. Lawley, 45 Lemoine Street, Braintree, Mass.

Sperry, in Washington, D.C., gets the prize for first answer to the reunion letter. He is coming, and Grant is coming along with him. Blair writes that he is working on Ken Seaver. Carleton Ellis, who has been spending the winter at Nassau, writes that he will be with us. Cy Hapgood, from his winter home in Florida, orders twin beds, and C. C. Brown writes to Allen that he will surely turn up. Among the locals, we can count on Howe, Allen, Ziegler, Charlie Smith, Draper, Fitch, Jackson, Crowell, Brigham, and Walworth. What's the matter with your dotted line?—C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

## 1901

In our class notes of February, 1938, reference was made to Charlie Bittinger as a member of the National Geographic Society—United States Navy Eclipse Expedition to Canton Island in June, 1937. In the issue of the *National Geographic Magazine* for June, 1938, there was included a considerable account of that expedition, with references to Bittinger and a reproduction of one of his paintings of the eclipse, which was exhibited at the New York World's Fair. The duration of the eclipse on the island was only three minutes and 33 seconds, so that Charlie had to do some fast work in making his painting. In order to capture as much detail as possible, he prepared in advance half a dozen different backgrounds; when the moon started to cross the face of the sun Charlie devoted his time to capturing the effect of the streamers, prominences, and similar phenomena. The *National Geographic Magazine* for July, 1939, included a further reference to the expedition and showed copies of eight astronomical pictures which were painted by Bittinger, well-known as a pioneer in the field of scientific painting.

Bittinger originally planned a career in physics and attended M.I.T. for that purpose but changed his plans because of his interest in art and spent four years at the École des Beaux-Arts in Paris. Paintings by him are now on exhibition in the National Arts Club in New York, the Art Museum of St. Louis, the Boston Athenaeum, and the Metropolitan Museum of New York. As a member of the National Academy of Design he has also been the winner of many prizes and awards.

Bittinger pioneered in "changeable paintings," which appear as portraits when illuminated by ordinary light but are revealed as landscapes when light from a different part of the spectrum is thrown upon them. On the walls of a room at the Franklin Institute in Philadelphia are three murals done by Charlie in fluorescent paints, visible only when ultraviolet light is thrown upon them. Under ordinary light the walls appear white. A beautiful painting of the spectrum of the sun, by Bittinger, adorns the National Academy of Sciences Building in Washington, and Charlie painted the solar spectrum in Webster's *New International Dictionary of the English Language*. We understand that in planning and working out the paintings for the July edition of the *National Geographic Magazine*, Charlie expressed himself as feeling more than ever that astronomy is the greatest monument to human intelligence, which has explored out into unimaginable depths of space with nothing more tangible than the fragile waves of light; also, that astronomy gives us an appreciation of the power and wisdom of the unseen hand of the Creator.

In The Review for February, 1939, we made reference to earthworm tillage as practiced on the North Stonington, Conn., farm of the brother of our classmate, Anna Billings Gallup. Miss Gallup's brother was formerly connected with the Travelers but retired several years ago, and his farm is his hobby. Your Secretary and Mrs. Wight were, therefore, much delighted to receive an invitation to spend last Thanksgiving (the real one, not the New Deal event) with Miss Gallup and her brother in their delightful home and to have thereby an opportunity to explore the mysteries of earthworm tillage, to inspect Mr. Gallup's hornless beef cattle, and to look over his specially selected Plymouth Rock roosters and hens. Would that we could all retire to the country and improve our outlook on life, as well as improve the products of the soil and the development of better livestock! Miss Gallup, as previously announced in these notes, recently retired from the Brooklyn, N.Y., Children's Museum. As emeritus curator-in-chief she continues to do much speaking and writing in connection with the developing of additional children's museums. On December 12 she made an address at the celebration of the fortieth anniversary of the founding of the Brooklyn Children's Museum, Mayor La Guardia of New York having issued a proclamation naming that day as Children's Museum Day.

Ed Beckwith, who was graduated from Course V and who now makes his home at Garrison, N.Y., writes that he is director of the I. B. Corporation, 58 Charles Street, Cambridge, Mass. He states that that corporation has developed a process for color photographic printing for still pictures based on the patents of the Technicolor Company, formerly held by Comstock and Westcott, Inc. Beckwith wrote that he was to be a member of the Fairchild Tropical Expedition which planned to leave Manila, P.I., in December in a boat especially built for a six months' cruise in the Moluccas, Netherlands East Indies. The expedition is in the charge of David Fairchild; and the object is the collecting of flora for introduction into the United States. Beckwith stated that his part would be photography, especially in color. We shall be disappointed if Beckwith does not send us generous comments when he returns from his explorations.

Our fortieth reunion next year should be especially interesting if all the '01 men who have been traveling can be induced to attend and tell us of their adventures. — The Alumni Office advises the following changes of address: Chester N. Chubb, I, San Antonio Public Service Company, Post Office Box 1771, San Antonio, Texas; P. Freeman Goodwin (noted last month as being with the United States Veterans Administration, Washington, D.C.) now Post Office Box 326, Kennebunkport, Maine; King H. Knox, VI (home address), 2744 Lake Shore Drive, Baton Rouge, La.; William J. Sayward, IV, Sayward and Logan, Palmer Building, Atlanta, Ga. — ROGER W. WIGHT, *Secretary*, The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

## 1902

News has been received of the death in January of Paul E. Chalifoux. Chalifoux was a resident of Birmingham, Ala., where he had lived since 1913. Previous to that year he had been there at intervals, supervising the department store business which he carried on along with that in Lowell, Mass., which had been his father's. In 1913 he bought a large interest in the Kirkpatrick Sand and Cement Company, one of the largest producers of sand and gravel in the South, took up his permanent residence, and became treasurer and general manager of the company. At the time of his death he was serving as vice-president and treasurer. He also had an interest in the Radcliff Gravel Company in Mobile, and it was while in Mobile on business on January 16 that he suffered a stroke which caused his death on the 17th. Chalifoux was a member of the Presbyterian Church, Rotary Club, and several other organizations, and served as president of the Little Theatre of Birmingham. He was high in Masonic circles, being a 32d degree Mason. At the time of his death, he was the Institute's honorary secretary for his region, helping to promote its interest by

1902 Continued

securing desirable prospective students. Chalifoux left no children but is survived by his wife, the former Miss Dora McLester of Birmingham, whom he married in 1909. He attended Alumni Day in 1938 and lunched with the '02 men but was unable to be present at the dinner in the evening.

Classmates using the new overpass at the Cottage Farm Bridge will be interested to know that it was designed by Moore. He described its engineering features to a meeting of the Boston Society of Engineers, and the description appeared in the October number of their *Journal*. — News items are needed. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

## 1903

Your Assistant Secretary attended the midwinter meeting of Greater Boston Alumni at the Walker Memorial on January 10, and was glad to meet Jack Howard, Gould, and Denham there. We struggled our individual ways through the buffet supper, met some whom we knew from other Classes, listened with interest and pleasure to Dr. Perrine's talk on the behavior of sounds and to Dr. Compton's, on the state of the Institute, and were glad we went. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.

## 1905

First returns of the questionnaire sent out in regard to our 35th reunion, May 30, June 1 and 2 at Old Lyme, Conn., are not only startlingly prompt but very encouraging. The late February score today, three months prior to the big opening day, is sixteen positively enrolled, twenty-six probably, seven possibly. Using the Secretary's knowledge of previous commitments of old-timers, we can easily add thirty, making a probable total of seventy-two, with half of the Class to be heard from. Bill Motter, Jr., is in charge of the New York delegation; Pete Harvey, Chicago; Merrill (know him?) Bartlett, Philadelphia, Camden, and vicinity; John Damon, Washington, D.C.; Charlie Johnston, the Southland; Dick Senger, the Rockies; and Bob Gardner, the Pacific Coast. Among those threatening to make Old Lyme for the first time are Charlie Smart, P. G. and Logan Hill, Lorenz, Luce, White, Lum, Mackie, C. A. Emerson, Jr., Rubel, Morrill, Amberg, Webster, O. C. Merrill, and Perkins. Joe Daniels is even planning right now to change his college graduation dates so as to make it. If you haven't signed up, do so at once.

Elmer Wiggins, in sending in his acceptance of the job of corralling all Rhode Island members, writes: "You probably have noticed something about the activity at our Boston and Norwood bases concerning the Civil Aeronautics Authority college training program . . . M.I.T. was the only college in the East last year to have a group of students take this course . . . given by E. W. Wiggins Airways, Inc. This year the program was

thrown wide open to all colleges which wished to participate. We were selected by nine different colleges to give the flying instruction to their various students, who totaled over 250. For this training we have to reserve twenty-three planes and as a matter of fact for reserve we have ten extra planes. We also have to reserve twenty-three pilots, as the government requires one pilot for every ten students and one plane for every ten students, and, to be on the safe side, we have about thirty-three pilots altogether. . . ."

Theodore P. Moorehead, I, of Bhaunagar, India, sends this message and wishes to be remembered to all his old pals: "I came to India seven years ago to develop the Port of Bhaunagar, which included the construction of an artificial harbor, wharves, and transit sheds, costing about two million dollars, where we had to deal with waters heavily laden with silt and with a tidal range of over thirty-nine feet. Soon after I came here I was made manager and adviser of the state ports, so remained after the completion of the works over two years ago. Bhaunagar is a native Indian state, with an area of about three thousand square miles, ruled by a maharaja. After being a widower for ten years I married again a year ago. I have three sons and one daughter, my second son graduating from Tech with the Class of 1937. I am also a grandfather."

Gene Kriegsmann, I, upon being prodded as to his new address in Edgewood, R. I., sends us another story of his life, which will be on exhibit at Old Lyme for those who have an extra week off to read. Gene wishes us particularly to correct an item in the February Review. He has been engaged in various executive activities with the P.W.A. since May, 1934, but is now on a permanent furlough, since the administration is being liquidated. "This should tickle the New England Republicans of '05," says Gene. Statistics: 5 feet 6 inches, 165 pounds, still single. — Prince Crowell is wearing an even broader smile, if you can imagine it. Persis Crowell arrived on January 31, putting Kid Crowell in the grandfather class. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 75 State Street, Boston, Mass.

## 1907

At the end of the class notes in the March Review was noted the death of Walter B. Gonder on January 16. The correct date was January 15, as appears in the following note received from Walter's widow: "Thank you very much for your warm expression of sympathy. I would have written before this, but I have been so stunned and bewildered that it was impossible. The shock was so sudden, as Walter had always been in wonderful health. He retired on Sunday the fourteenth, at eleven-thirty, and soon afterward felt an excruciating pain in his chest. I called the doctor and at one-thirty — January 15 — he was gone, coronary thrombosis. Dick (son, Rich-

ard Patterson Gonder, born December 1, 1918) graduates this June from Rensselaer Polytechnic Institute at Troy, N.Y. Walter had always been so proud of him and was looking forward to his graduation . . . I recall having heard Walter mention you in very warm terms, so please accept deepest thanks from Dick and myself to you and the Class of 1907."

For a year after graduation Walter, usually known as Commie, was a chemist with the government in the Philippine Islands, followed by service as superintendent for the Mindoro Company in the Islands from 1912 to 1915. From 1916 to 1921 he was general manager for the Hershey Corporation in Cuba, becoming vice-president of Frederick Peirce and Company in 1923. From 1929 until his death he was president of Gonder, Kelley and Company, investment bonds, in New York City. He was a member of Alpha Tau Omega Fraternity. The home address of his widow, Elizabeth Patterson Gonder, and Dick, the only child, is 3315 80th Street, Jackson Heights, Long Island, N.Y.

Through an item which I noticed in the Boston *Traveler*, a clipping from the New York *Sun* kindly sent to me by Henry Martin, and a clipping from a Peruvian newspaper, coming from thoughtful Frank MacGregor, I learned of the sudden death of John P. Chadwick, occurring on February 4 from heart disease at his fishing camp at San Jose de Maipo, near Santiago, Chile. After receiving his degree in mining engineering John was with the Tennessee Copper Company from 1907 until 1910, and then spent about a year each with United States Mining, Smelting and Refining Company and the Miami Copper Company. In 1912 he went to Chile for the Braden Copper Company, being stationed at Rancagua as assayer and chief chemist. He joined the Companie American Smelting as an ore buyer at Carrizal Bajo, Chile, in 1916, becoming smelter superintendent and manager; in 1920 he became president of the company and also was general South American representative of the American Smelting and Refining Company. John was a native of Saco, Maine, was a member of Phi Kappa Sigma Fraternity at Tech. On October 5, 1929, he married Mrs. Marion Wilkins Desler, who with two children — John P., Jr., born in October, 1931, and Diane — survives him.

I have also received word of the death of John L. Pultz on June 15. He was with us during our freshman year only, and nothing is known to us about his previous activities or address.

Unfortunately, we have news regarding only one '07 man who is living. On February 16 was held in Philadelphia that area's Modern Pioneers dinner, sponsored by the Philadelphia Chamber of Commerce, with the National Association of Manufacturers co-operating. More than a thousand business leaders of eastern Pennsylvania, southern New Jersey, and Delaware attended, and awards were made to 112 individuals and groups of inventors, scientists, and research en-

*You will find on page I information on Alumni Day, June 3*



## 1907 Continued

gineers for outstanding contributions to industry in the form of new inventions and new processes. Our classmate Dick Woodbridge, who is chemical director of the smokeless powder department of E. I. du Pont de Nemours and Company at Wilmington, Del., together with another man, received an award for a method of making propellant powder; Dick was cited also for work with others in the development of a process for utilizing smokeless powder as a source of cellulose nitrate for coated fabrics and finishes. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

From Paul Wiswall comes the following: "For quite a few weeks after Thanksgiving I was very much out of circulation. An attack of pneumonia knocked me flat without any warning. Thanks to the new drug, sulfapyridine, which Benny Dow tells me his firm may have made, the infection was soon under control, though I discovered that the real crux of my recovery was the fact that I am not twenty-five years younger than I am. However, I have been to the office for the past week for a good part of the day and I am looking for the building up of the energy I lost while I was spending three weeks in the hospital. My doctor insisted that I have a change of scene before I went back to the office, so I made a round trip to the Caribbean on one of the United Fruit ships. Thanks to Harry Worcester '97, II, Vice-President, the fruit company treated me as if I were a delicate exhibit that needed special care. I rather thrive on the accommodations and the fare I received. We stopped at Kingston, Jamaica, both going and coming. There were two stops in Colombia — at Barranquilla and at Cartagena — and a whole day at Colón, with plenty of time to see the canal from end to end. Incidentally, I had my first opportunity to set foot on South America, so that now I have been on all five continents.

"After the continued cold of this winter and because I was a bit under par, the beautiful summer weather was very much to my liking. Jamaica seemed to be unusually hospitable. It is not so imposing as Java and Ceylon. The high hills were crowned all day with a mass of soft, white summer clouds; everything was fresh and green; and I have come to the conclusion that a holiday in Jamaica — four days from New York — is something to bear in mind when the cold north winds are blowing in January and February. Two hotels I visited were excellent. On the ship as we left Jamaica, I found one of the senior medical men of the Canal Zone who asked me to come to his home for lunch when our party from the ship went over to the Pacific end of the canal. The Stayers live in a large frame home that was built when the canal was under construction. I have never seen such a building in the tropics in the Eastern Hemisphere. There was a deep

veranda on all four sides, and Mrs. Stayer told me of some ten, or more, sleeping rooms and eight, or more, baths. I was entertained royally and ended my stay in Balboa Heights by being given a special sight-seeing tour with Mrs. Stayer as my sponsor and guide. Pretty soft, I thought! In Cartagena you see a city that was by no means new when the Mayflower landed her company on Plymouth Rock. I still wish I were back in Jamaica, basking in the sun at the edge of the hotel swimming pool and sipping planters' punches!"

Thomas G. Chapman has been made dean of the new college of mines at the University of Arizona at Tucson, the appointment to take effect July 1. After graduation, Tom was an assistant in Course III for a while, subsequently going to the Michigan College of Mines. In 1916 he went to the University of Arizona as associate professor in metallurgy. In 1917 he was appointed professor of metallurgy and ore dressing, and metallurgist in the Arizona Bureau of Mines, and in 1933 he became the head of the department of metallurgy. In 1926 he received his degree of doctor of science at M.I.T.

He is the author of three bulletins on ore treatment, issued by the United States Bureau of Mines and the Arizona Bureau of Mines, and has served at various times as consulting engineer for the United States Bureau of Mines, American Smelting and Refining Company, and other well-known organizations. He has recently developed an improved process of cyanidation by the simultaneous dissolution and adsorption of gold for treating ores that cannot be handled advantageously by the usual cyanide method.

Arthur B. Morrill will be the manager of the new Detroit sewage treatment plant, now nearly completed. Art was engaged from 1925 to 1932 as assistant engineer of filtration of the water system, working on the design and construction of the city's spring-wells filtration plant. In 1936 he became associate civil engineer on sanitary design on the new sewage treatment plant. He has been active in the Engineering Society of Detroit, of which he is a charter member. — G. A. Joslin was recently elected vice-president of the Mining Association of the Southwest, at its annual election. — Burr A. Robinson is associated with the Burpee Gardens at Fordhook Farms, Doylestown, Pa., which has recently developed a Tetra Marigold — the first new flower created by the use of chemicals. Some of these new marigolds were recently displayed to horticulturists and garden lovers at the Waldorf-Astoria by invitation of David Burpee, the hybridist. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

## 1910

When your Secretary was in Richmond, Va., late in January, he had the pleasure of a short visit with Charles Creecy. Neither had seen the other since 1910, and it is doubtful if recognition would

have occurred elsewhere than in Creecy's office. Creecy has been with the telephone company since graduation, first in Baltimore and then in Washington. He is now plant extension engineer of the Chesapeake and Potomac Telephone Company, with offices in Richmond. He had charge of all the revision of telephone work in Williamsburg as required by the restoration of that city sponsored by John D. Rockefeller, Jr. Creecy was married after the World War and has two sons.

Charles Almy, Jr., of the Dewey and Almy Chemical Company has been in Hawaii and will return about the middle of this month. — Your Secretary has had letters from A. I. Phillips, Jr., George W. McRae, Chester W. Wilson, George L. Mylchreest, Harold Manson, Laurence T. Hemmenway, and Arthur L. Stein in regard to the coming thirtieth reunion. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

## 1911

Our hats are certainly off and waving for Alf de Forest, XIII, one of the twenty-nine New Englanders singled out for recognition as Modern Pioneers because of their contribution to American life and industry, at a dinner at the Copley Plaza in Boston on February 20 in commemoration of the 150th anniversary of the United States patent system. The scrolls were awarded by our own President Compton, chairman of the National Association of Manufacturers' committee on Modern Pioneer awards. Alf, who has a full professorship in the Mechanical Engineering Department at the Institute, was rewarded for his invention of the highly effective magnetic method of testing steel for flaws.

Another junior '11'er wedding: Robert T. Haslam, Jr., married Marcella Neal Compton, daughter of W. A. Compton of Pomeroy, Ohio, in that city on December 28. Young Bob is a graduate of Dartmouth College in 1939 and at present is taking graduate work in engineering administration at M.I.T. His bride is a graduate of Radcliffe College. The couple will live in Boston. — The Boston Rotary Club *News* in late January said: "Emmons Whitcomb is happy to announce this week that for the first time in athletic history, a hockey team, the Providence Reds of the International-American League, was playing a full week's schedule away from home, traveling exclusively by air between games. A chartered United Air Lines mainliner is taking the team to Cleveland, Indianapolis, Pittsburgh and Syracuse for games." Emmons told me subsequently that the final hop, from Syracuse to Providence, was made in exactly one hour and 40 minutes. — Boston's annual Community Fund went over the top this year by one-half of 1 per cent. Classmates may well be proud of the record of 102.7 per cent made in Hyde Park, where Mrs. O. W. Stewart was leader of the two hundred workers in that Boston ward. O. W.'s wife, by the way, was the only lady captain in the city-wide divisions.

## 1911 Continued

Harry Tisdale, V, wrote in late January that in November his wife had accompanied him on a business trip by auto to Chicago, where they spent some time with Joe and Rose Harrington, returning via Toronto and New York State. On their way home to Scarsdale, N.Y., from a New Year's visit in Schenectady, however, the old auto jinx caught up with them again, this time with dire consequences. Harry writes: "A car smashed into us almost head on just above Fish-kill, N.Y., the driver of the other car, trying to make a curve when going too fast, coming way over into our lane, and just about wrecking everything. Luckily we escaped with our lives. We all ended up in Highland Hospital, Beacon, N.Y., Grace suffering a compound fracture of her right kneecap and various cuts and bruises, while I received a badly cut left eyelid, which required seven stitches, with a bad bang on my left chest also, but no bones broken, fortunately. Grace is getting along nicely, and she should be home by Washington's Birthday. I talk with her every day on the phone and go to see her every week end. I've been strapped up all this month and I find that a muscle bruise in my left eye has caused double vision, so for the present I am forced to use only my right eye. I won't be able to drive again before spring and I sold what was left of our car for junk."

Since Christmas, John Herlihy's wife, Mabel, has been confined to her bed with a serious illness, from which the doctors look for decided improvement with the coming of warm weather. Good luck, Mabel; we hope you got out in your new Easter bonnet O.K.!

In February, I ran into Charlie McManus, I, snowbound in Worcester, unable to buck the drifts and reach Barre, whither he had started from Boston two days previously. As an engineer for the Massachusetts Department of Public Works, Charlie is making preliminary plans for relocation of the Barre River, to be undertaken in the spring. — Fred Daniels, VI, who has been a trustee of Worcester Tech since 1935, was renominated for another five-year term at the annual meeting of the W.P.I. Alumni Council in early February and a few days later was re-elected president of Riley Stoker Corporation. Also here in Worcester, in mid-February, Hal Robinson's older boy, Henry, was elected president of the Norwich University Alumni Club of Worcester County. He was graduated from Norwich in 1935 and is associated with his dad in civil engineering practice here. He told me that he and his wife, on their way home from their annual winter vacation in Florida, had a chance to talk with Ban Hill, I, President of the Baltimore Transit Company. Ban said his company had given Worcester a million-and-a-half dollars' worth of business recently, having placed orders for new cars with Pullman-Standard Car Manufacturing Company here.

Speaking of Baltimore, Julian Gravely, V, is now living at 105 Tunbridge Road in that city. — Lieutenant Colonel Henry C. Davis, VI, was transferred from

Hawaii to Fort Winfield Scott, Calif., and Major George C. Kenney, I, from Hempstead, Long Island, N.Y., to United States Army Air Corps, Matériel Division, Wright Field, Dayton, Ohio. Other new home addresses at hand include James R. Carpenter, I, 315 Havarre Avenue, Coral Gables, Fla.; William E. Fortune, I, 28 Centre Street, Brookline, Mass.; Roland S. Simonds, IV, 491 Maple Street, Manchester, N.H. — What do you think we had best do to celebrate our 30-year reunion in June, 1941? That's something John and I are anxious to know before appointing a reunion chairman. Let us hear! Please mark Monday, June 3, Alumni Day, on your calendar. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

It is with great regret that we have to record the death of two of our classmates: Allen B. Staiger, II, died on February 8, 1939, at Ventor, N.J. — Stewart Robertson passed away on January 20 at Dedham, Mass. Robertson had been with the Eastern Underwriters Inspection Bureau for years. He leaves a widow, two daughters, and a son.

Your Secretary had a pleasant visit with Albert Gale, I, on the *Federal Express* coming up from Washington the other night. Gale's older daughter is taking her doctor's degree in botany at Radcliffe and his younger daughter is majoring in etymology at Massachusetts State College. Mrs. Gale is very active in the Girl Scouts in northeastern Massachusetts. The Gale family had a harrowing experience when their summer home in Middleton burned at about two o'clock in the morning; they were barely able to escape with their lives. — Your Secretary enjoyed an evening with the J. Pratt family at Oak Park recently. Mrs. Pratt is still active in the Girl Scouts, now being regional director.

While visiting the annual convention and road show of the American Road Builders' Association at Chicago, the last week in January, your Assistant Secretary had the good fortune to meet Pete Redfern, IV, who was there with an impressive exhibit of his Byers line of shovels, trenchers, clamshells, and other heavy construction equipment. Judging by some of the advertising literature we picked up, Pete's machines make a casual mouthful of an ordinary hillock, and even mountains speedily melt away before them. Anyhow, Redfern certainly looked the picture of health, happiness, and prosperity, and we opine he deserves to. He's worked hard many years for the same organization, the Byers Machine Company of Ravenna, Ohio, and has forged ahead until he now carries the major sales-management responsibilities for the company, traveling the whole United States to supervise the sales efforts of some two hundred local representatives. — Jack Shore has sent in two photographs of freshman field day showing our football team in action, with

Arch Eicher in the foreground. Our tug-of-war team is shown in the other, just as it started to pull the sophomores over the line. These will be saved for the next reunion.

From Walter H. J. Taylor, V, who is now on his way back to China: "The notice of my change of address, I fear, is somewhat misleading, as early in March I am heading back to Shanghai to resume my job of teaching at St. John's University. This is one of the few educational institutions in China that has not been seriously interfered with, if not entirely disrupted or destroyed. It is true that for two years it has not been feasible to have Chinese students on our campus; that we have had to make shift in an office building near the bund in Shanghai, instead of using the ample and excellent facilities built up by more than fifty years of effort, five miles from the bund, outside the Settlement limits but, fortunately, just within the perimeter of the protected area or, rather, astride that perimeter.

"Though during the siege of Shanghai, our campus at Jessfield was at one time a hot spot, the buildings suffered no serious damage. Gradually now, classes are being resumed on the campus despite the fact that a serious situation exists on the so-called outside roads, where the authority of the municipal police is disputed by minions of the Japanese puppet government. Also in the village at our gates and in adjacent areas, gambling hells and opium dens thrive, and this does not conduce to the peacefulness of the neighborhood nor to the confidence of the parents of our students.

"As indicated, the famed Soochow Creek, the boundary of the defended area in the northwest sector of Shanghai, does not bound but intersects our campus. Unfortunately, the three natural science departments of biology, physics, and chemistry were housed in an up-to-date building with well-equipped laboratories in the trans-Soochow Creek area. In happier days, there was a private footbridge across the creek, before barriers became blessings. Reoccupation of our compound by students is a great step forward, but when we shall come into our own across the creek remains a question for the future. I have confidence in China's future and am counting on this country's putting an abrupt end to the tremendous assistance we have been lending to the establishers of the 'New Disorder' in Eastern Asia. . . ." — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N.Y.

## 1913

Late in February, I had the pleasure of visiting Bill Young, II, at his textile mill in Hamilton, Ontario. One of the departments of his business is narrow woven fabrics, my own lifework, and we talked plenty shop. They make all varieties of webbings that we make in this country, but their problems are different and greater because quantities are very much

*You will find on page I information on Alumni Day, June 3*



1913 Continued

smaller. My impression was that Bill's business was run in a very shipshape manner. In the World War he was one of the first men wounded. His father and mother sailed on the S.S. *Lusitania* to visit him in England and were drowned. Bill's elder son attended the Canadian War College and is across the water today.

In the chemical warfare service we have two men: Karl Briel, I, is with Procurement, in Boston; Fred Lane, X, is senior chemist at headquarters, Edgewood Arsenal in Maryland, for which plant I have made webbing for several years. — Halsey Elwell, II, for many years in the shoe business, is now at North Adams, Mass., with Wall-Streeter Shoe Company. — Ken Franzheim, IV, has recently removed from New York City to Houston, Texas. Ken has followed his profession, architecture, since graduation.

Rhys North, IV, art editor of the 1913 "Technique," is practicing architecture in Portsmouth, Va. — Paul C. Warner, IV, has reached the grade of lieutenant commander and has been transferred from San Diego to the Naval Training Station at Norfolk, Va. — Good old news hawk Dennie '11 sent a clipping from the Boston *Herald*, February 20 — a picture of Barbara Sage (Rusty's daughter), showing Miss Sage on ski at Lake Placid. Her brother, Nat, Jr., '41, is the star defense man of this year's Beaver hockey team. Young Bill Ready, a senior at the Institute, is engaged to Miss Janet E. Smith of Belmont, Mass.

From Bill Herbert, IV, at Santa Rosa, Calif.: "Married; three boys in college; my own business, architecture; busy, gray haired; Boston is a long way from here — seldom see anyone from M.I.T. — proud of my school!" How interesting '13 notes might become if we had a hundred Bill Herberts. — Jim Russell, II, handsome Jim, sent a program of the Sharon Fortnightly Club, Inc. — a presentation of "Lavender and Old Lace." The part of Dr. Howard Patterson was played by Mr. Peck; Jim says "not ambidextrous but Harry Dexter-ous Peck, his second play this winter season." Harry, you old rascal! — FREDERICK D. MURDOCK, Secretary, Murdock Webbing Company, Box 784, Pawtucket, R.I.

## 1914

Ernest D. Wilson, who took graduate work with our Class, has been appointed to the faculty of the Worcester Polytechnic Institute, and will head the combined chemistry and chemical engineering departments. — Franklin C. Fette is another who took graduate work with 1914. He has been stationed in China as treasurer of the Fette Rug Company at Peiping, but visited the United States last summer to see his son, Russell, graduated from Dartmouth. — Those classmates who have had the pleasure of seeing Werner Schaurte on his various visits to the United States will be interested to learn that he was in Canada on one of his regular trips when war was declared, and it is expected that he will remain there during the war. He heads Bauer and Schaurte, Inc., Neuss, Germany.

The Worcester *Gazette* has contained various articles recently regarding the activities of the Arthur W. Johnson family. Arthur's daughter, Barbara, has been winning various honors as a student at Bates College. Mrs. Johnson was recently the hostess at a large luncheon given by her in honor of Mrs. Albert J. Hoyt in connection with the departure of the Hoyt family to Cleveland, where Al has a new position with the American Steel and Wire Company. Your Secretary is indebted to O. B. Denison '11 for forwarding numerous clippings from Worcester. How about a few '14 men sending in clippings regarding our classmates?

Your Secretary is impressed with the splendid records being made at the Institute by sons of classmates. There are sixteen of them at the present time; one has already been graduated; and several more have entered application for admission. Dean Lobdell '17 has assured your Secretary that no scholastic record of a father is ever shown to his son. — Remember to be in Cambridge on Alumni Day, June 3. — H. B. RICHMOND, Secretary, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York, N.Y.

## 1915

Life begins in 1940 on our twenty-fifth reunion, and there are only sixty days left. The Boston group will leave the Institute on Friday morning, May 31, to motor to the Oyster Harbors Club, Osterville, Mass., not far from Cotuit, the scene of our tenth reunion. This is between Falmouth and Hyannis on Cape Cod, easily accessible on motor routes. The rest of the gang from other parts of the country is expected to arrive there in time for dinner Friday night.

The reunion is *stag* and will continue at Osterville until Monday morning, June 3. As the twenty-fifth-year Class we should all attend Alumni Day, June 3, at the Institute. We can leave Osterville in the morning in time to be in Cambridge for luncheon in the Great Court with the ladies of the Class. During the afternoon there is open house at the Institute for the ladies and then they are invited to the class cocktail party at four o'clock at the Hotel Statler, Boston. At six o'clock the ladies and guests return to dinner at President Compton's house in Cambridge, and we attend the big Alumni Dinner in the Statler. The ladies, returning from their dinner, join us after our dinner for a farewell at our suite in the Statler.

The whole party, including the price of your own ticket for Alumni Day and the entertainment of your lady guests at luncheon, cocktail party, and dinner, is only \$19.15. What do you think of that for a class bargain? Further details will be in the notices sent you. At this attractive price and with the good time in store for you, there should be no reason why you all should not come to make this the biggest and best reunion ever.

In New York recently I had dinner with St. Elmo Piza and his sister, Margaret. A delightful evening, and I am

still laughing at his stories! I also spent some time with Allen Abrams but just missed Ken King, both of whom were at the annual convention of the American Paper and Pulp Association. Charlie Paine, who is with the Eastern Manufacturing Company in Bangor, Maine, wants to attend the class dinner in Boston — there's loyalty for you! Don Perin, probably as big as ever, is now working for the Hamilton Propeller division of the United Aircraft Corporation at East Hartford. We all hope he wears his 1915 sweater to the reunion. — A nice letter from Herb Anderson when he returned to Philadelphia from his wedding trip at Sea Island, Ga., said he hopes Mrs. Anderson and he will be able to attend the reunion in June. Sorry we missed Herb at the New York dinner.

Also while in New York I spent some time with Sam Berkowitz, who is actively interested in the twenty-fifth reunion and is doing his bit with the New York committee. Without a doubt the class dinner held in New York City at the Hotel Carlyle on February 6 was one of the best class gatherings that I have ever attended, with an unusually sentimental touch in seeing men we haven't seen for twenty-five years. First we had cocktails, then a delicious dinner, and then the Honorable Speed Swift, who came all the way from New London, N.H., to show his collection of class pictures embellished with "Help Aze!" art work. What a party! Present were Max Woythaler, V, Albert Anderson, I, Sam Berkowitz, II, Deoch Fulton, IV, Cliff Sifton, VI, Frank Parsons, II, Stan Willis, III, Charles Williams, I, Harold Warfield, I, Bartlett Pinkham, I, Gilbert Peakes, XIV, R. T. Friebeus, I, Lloyd Chellman, I, Henry C. Sheils, I, B. W. Lassen, VI, Wayne Bradley, V, Johnnie O'Brien, II, Henry F. Daley, II, Jim Tobey, VII, C. F. Wolfe, I, William Smith, I, M. W. Cowles, XI, Hank Marion, VI, Ernie Loveland, X, Kebe Toabe, V, Chauncey Durkee, II, Herbert D. Swift, II, George T. Rooney, I, Aze Mack, X, Fred Cook, II, and St. Elmo T. Piza, IV. Jerry Coldwell wired from Cleveland, and Howard King from Buffalo, that they both had planned to fly but were held up because of icy storms.

You will note from this list that there were a bunch of us from Boston who went down, as this was a splendid opportunity to announce plans for the twenty-fifth reunion. Everybody was enthusiastic about the choice of site, and the gang pledged support to make this a successful reunion. Anything that I might say to describe this dinner and evening with our classmates would fall short of doing it full justice.

You can see from the attendance that Course I dominated the party, so we had little Andy building the tunnels all over again for us and much fun in debating on the relative ability of architects and engineers. Chet Runels is on our Boston committee and always attends loyally, so I am sorry to tell you of a recent accident he had. As Chet wrote from Lowell: "Have I been getting the 'breaks'? Or

1915 Continued

have I? On December 12, I broke my right ankle — a double fracture and dislocation. After being discharged from the hospital I had a touch of pleurisy and have been confined between the hospital and home for six or seven weeks. How did I break this leg? No, I was not skiing; just leaving a friend's house, stepped on some ice in the dark, and down I went! No, nothing to drink. Doctor said it was too bad, for then I would have been relaxed! I did listen to the 'Information, Please' program that night — maybe I can sue Canada Dry. Moral: If it is slippery on the night of the committee meeting, you fellows had better learn to relax! and how!"

When I returned home I received the following good letter from Henry Daley, written from the B. F. Sturtevant Company, Camden, N.J.: "I just wanted to write you and thank you and the boys for the delightful evening in New York last week, or should I say evening plus a good portion of the following morning. It was good to see so many of the boys whom I had not seen in nearly twenty-five years and to find them looking so well and bearing few scars of the past quarter century. Will certainly look forward to the big reunion in June on Cape Cod. . . ." — You have all done well so far to "Help Azel." It won't be long now till May 31 for the biggest and best twenty-fifth reunion. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline, Mass.

## 1916

During the month of January, Dave Patten was elected a director of Whiting, Weeks and Stubbs, investment bankers of Boston, Mass. — The Boston *Herald* for February 19 carried a picture of a young lady and a young man, with the following explanatory caption: "Duke of the carnival of Colby Junior College, New London, N.H., this weekend was Ted Guething, M.I.T. '41, the guest of Miss Joan Russell of Brookline, a junior at the college. Miss Russell received the plaque for snow sculpture in the inter-dormitory contest." — Nice work, Cy!

Riding on the *Merchants Limited* from New York City to Boston on Monday evening, February 5, your Secretary ran into Hovey Freeman in the dining car. He has a boy graduating from M.I.T. in June. Hovey was planning to leave for Guatemala during the week of February 12, to be gone five or six weeks. He told me that Ed Parsons has been taking flying lessons and plans to commute between his summer home at Warwick Neck, R.I., and his place of business at Phillipsdale, R.I., where he is plant engineer for the Washburn Wire Company and the American Electrical Company. Hovey is looking forward to serving again on the reunion committee, which should start functioning early next year for our silver jubilee. Other members of former reunion committees please take note.

The following letter was received late in January from R. S. Lyman, who started with our Class at the Institute. Let us hope he will be with us at our twenty-fifth reunion a year from this

coming June: "It has always been a source of satisfaction to me that I have had some contact with M.I.T. However, it seems a bit strange to me to be included in any Class there. It is also quite a surprise to me to find that Val Ellicott can be regarded as being in any way a classmate of mine at Tech. We knew each other in medical school some twenty years ago, but probably never saw each other at Tech.

"As to China, that is a very long story which carries no adventure or romance. I think it can be quickly told: After spending some time in Leningrad at the Institute of Experimental Medicine under Professor I. P. Pavlov, I went to the First National Medical School in Shanghai. I had charge of neuropsychiatry there for one year; then went to the Peiping Union Medical College for five years in the same capacity. Then, although we all knew that the Japanese would invade North China sometime, I decided a couple of years before they actually came that it was time to try to get back into the United States. Actually I did not leave China until after the Japanese had taken Peiping. I had occasion to see something of the Japanese army on three occasions: in 1931, 1933, 1937. My experiences with them have convinced me that one deals with entirely different propositions when one visits the Japanese in Japan and when one sees the invaders in action in China. So long as the Japanese army has a strangle hold on the policies of the Japanese government, I think there will be no chance of laying the foundations of a secure basis for trade by our government in the Orient — except on Japanese terms. Those terms will, of course, allow American interests only so far as the Japanese themselves cannot fill them out of their own resources. The competition will become increasingly severe if and when all Chinese territories under Japanese control become the sweatshop for Japan." — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

## 1917

Once again, I [Ted Bernard] am going to bat for Ray, who is up to his neck in work as chairman of a committee making a national survey of industrial research. Our Assistant Secretary is also busy, planning for his first real vacation in many years, inasmuch as he is relinquishing the chairmanship of Exeter's summer session.

To those good fellows who supplied me with news and gossip, many thanks. For example, Ray Brooks writes that he has just completed a flying trip around most of the country, and the efficiency of the air transport system is such that he was back where he started before he had time to see anyone. "After all, little old New York is the area to meet Seventeeners"; and he proves his point by mentioning a rendezvous with Gus Farnsworth, Enos Curtin, Win Swain, and Dad Wenzell. Dad confirms this, adding that Win has been running a farm in Virginia but

is now back in New York. This will interest Bill Eddy, who had previously informed us that Win had retired as a gentleman farmer. We hasten to add that the change applies only to the farmer part; Win still remains, as always, a gentleman.

Dad is vice-president in charge of engineering for the First Boston Corporation, with headquarters in New York City. Recently in Milwaukee he had a visit with Phil Cristal, who is still doing a swell job as director of research in the railroad bond department of the Northwestern Mutual Life. I know from first-hand information that Phil rates tops with the senior officers of the company.

To get back to Ray Brooks for a moment, he spent the other evening quaffing a few steins of P.O.N. at a shindig staged by the Northern New Jersey Tech Club, where he was ably assisted by Frank Maguire. Alan Sullivan was among those present. All had a few extras for brother McNeill — co-founder along with Frank of this live Club — who on this occasion was among the missing. Ray ends his report with a touch of nostalgia: It was his sorrowful duty to sell a couple of old Fairchild and Ford planes which the Bell Laboratories owned.

Chemical engineers have a pretty good record for attendance at class reunions and between times they foregather at meetings of their societies. From Ken Bell we learn that those present recently at one meeting included Walt Whitman, Head of Course X; Frank Howard, in charge of the chemical engineering department at Worcester Polytechnic; Don Coakley of the National Aniline Chemical Company in Buffalo; Johnny DeBell, who is reported to have gone into the consulting field, with headquarters in Hartford; Dave Pierce, chief engineer of the Rohm and Haas Company of Philadelphia; Carl Dean, who travels out of St. Louis as an expert on the installation of sulphuric acid plants for Monsanto; Barney Dodge, head of the chemical engineering department at Yale; and Bill McAdams of the Institute. Barney Dodge is writing a book and it ought to be good, for he can command the talents of his wife as ghost writer. She has had several historical novels published in this country and England, but we can't give her royalties a boost, for we know neither her pen name nor the titles of her books. Ken recently saw Sam Clayman, who is traveling out of Philadelphia for the Clinton Company, corn-sugar people, and Ray Blanchard, who is one of the big shots at the Hood Rubber Company. As to Ken himself, he is still going along in his usually placid way and getting places — a daughter at Simmons and three other youngsters coming along.

Penn Brooks wrote that he had no news, but in the next mail we learned from Mac McGrady, Dick Whitney, and Ray Stevens that they had recently been wine and dined by Mr. and Mrs. Brooks. Mac writes that Penn recited a lengthy history of "The First Brooks in Maine" and that Fat has a recording of it which he is keeping on ice for the twenty-fifth.

*You will find on page I information on Alumni Day, June 3*



1917 Continued

Photographic notes: One of the Kodachromes of Paul Bertelsen's house has been shown at the Rochester Art Museum. But imagine an artist wasting his talents on a plate of oysters! Dix Proctor, who saw Mac in New York, wrote: "I can still see him standing on the stool at the oyster bar at the Grand Central Station, shooting a plate of large oysters reposing on the bar." We have an unconfirmed report that the negative was blurred. Probably one of the oysters moved. Hence, we suggest an Edgerton stroboscope for high-speed photography of this nature, although we've wondered for a long time what use could possibly be made of a picture of a plate of oysters. — Dix also reports that Bob Marlow is fully recovered from his bad accident of a year ago; that Erling Stockmann is still with the Consolidated Gas Company of New York and will again be in charge of that company's exhibit at Mr. Whalen's 1940 show. Stocky must have a good job, for he occupies an office large enough to stage a full-sized reunion. We were sorry to miss Dix when he was in Boston recently, but he was well taken care of by Lobby, who introduced him to the famous Lock Ober on Winter Place.

Bob Erb reports that he shared the platform at a recent Legion meeting in Manchester, N.H., with Jimmy Doon, who is department commander of the Legion for the state of New Hampshire. — Dick Whitney occasionally sees Bob Harkness, the western manager of the *Woman's Home Companion*. The call of fresh water has finally caught up to Dick, and he bought a smart one-design sailboat. — Potts Mehaffy made a valiant effort to do his duty but just hasn't made connections with any of the crowd recently. He gets some solace, however, from the activities of the Washington Tech Club. — Dick Loengard confirms our earlier report that McGrady was in New York during the holiday season and adds that Mac held an impromptu reunion in the lobby of the Commodore, at which he introduced his young daughter to some of the elite of the Class. Dick has been exceptionally busy as a result of two favorable decisions in the Federal district court in Chicago, involving infringement of United Chromium patents. — Schoony Schoonmaker is a major in the Coast Artillery Corps at Room 1300, Post Office Building, Boston. — Walt Beadle reports that he saw Osgood Holt not long ago; the latter is apparently allergic to bronchial pneumonia, having resisted two attacks of this unpleasant disease in the last year or so.

As a result of the G.O.P.'s regaining power in Delaware, Dutch du Pont is now chairman of the highway commission. We can't guarantee that this gives you any special privilege to step on the gas when you are in Delaware. In fact, knowing Dutch, we think you would pay the same fine as if you belonged to the Class of 1916, and that is as it should be. — Dudley E. Bell, Esq., writes that he has been racking his brain for news about the Class. After reading through his lengthy letter several times, we come back to our

opinion of many years' standing that Dudley's brain works best when it is relaxed. That's just in fun, Dud, and your contribution to this column is greatly appreciated. The following are the opinions of this correspondent and do not necessarily reflect the views of the Editors. Having taken the fateful and delightful step himself after all these years, Mr. Bell believes that our two outstanding and distinguished bachelors, Ras Senter and Jack Wood, are just a shade short of being morons for not immediately following his example. Dud is somewhat concerned that out of the 450 or so who entered with our Class, he can remember and keep track of only about 425. If they are still alive, he would like to hear from Cy Medding, Frank Conaty, Tubby Stout, Alphabetical (we assume he means C.H.M.) Roberts, Deke Young, Sherry O'Brien, Artie Baker, and Johnny DeBell. These gentlemen can relieve Dud's racked brain by communicating with him at Bristol, Pa. He is still trying to crash Broadway with his drama and says that if he had Lobby's sense of humor and power of expression, he could make the grade. We have the most sincere admiration and liking for the Dean but didn't appreciate that he was that good, in spite of the fact that his article on railroading in the February Review rated editorials in the *New York Times* and *Boston Herald*. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

## 1918

A Glen Ridge, N.J., paper of January 5 announced that Herbert B. Larner was elected to the position of president of the Glen Ridge Board of Health at the 1940 organization meeting: "Mr. Larner, who was born in Cambridge, Mass., moved to Glen Ridge in 1927 from East Orange. He lives at 256 Forest avenue and was appointed to the Board of Health January 1st, 1936, to fill the unexpired term of one year of Councilman Bertram I. Dadson. He was reappointed to two-year terms in 1937 and 1939. . . . After Mr. Larner graduated in 1918 from the Massachusetts Institute of Technology with a B.S. Degree in Biology, he was an officer in the U.S. Public Health Service and sanitary officer of Muscle Shoals, Ala., sanitary district, under Dr. Thomas Parran, now surgeon general of the U.S.P.H.S. He is now manager of the Vitamin Division of the S. B. Penick & Company, 132 Nassau street, New York, recognized as the largest botanical drug house in the world. . . ." — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

The Class had a dinner in the main dining room at the Technology Club, 24 East 39th Street, New York City, on February 20. Even H. E. Lobdell '17, Dean of Undergraduate Students at the Institute, who was at the Club on the night of our dinner, admitted in one of his

weaker moments that 1919 was well represented and was certainly to be classed as "alive." The following members attended: Don Way, President, Ted Shedlovsky, Bernard Coleman, A. R. Wiren, Bob Bolan, Fred Given, George McCarten, Bill Bassett, Nelly Bond, Tim Shea, Ellsworth Paterson, Paul Blye, Lester Wolfe, and Gene Smoley. F. Porcher showed up but had to leave before the dinner. Regrets were received from Grant D. Green, Jr., Elisabeth Coit, E. M. Kenison, Myles Connors, Larry Riegel, Oscar deLima, R. Gilbert, Karl Rodgers, and Will Langille.

Bob Bolan, who has changed his address to 639 East Avenue, Bay Head, N.J., has recently married. In spite of the fact that he announced that he was going to demonstrate how fat he had grown, we all thought he looked very well, and anticipate seeing him more often, now that he is in the New York vicinity. — E. M. Kenison wrote from the Elks Club, Scranton, Pa., that he is doing valuation work for the American Gas and Electric Company on their property in Scranton. He expects to be located at Canton, Ohio, late this spring. — Myles Connors wrote that he would be in Florida at the time of the dinner.

Larry Riegel was engaged in a paper trade convention in New York on the same night as the dinner. The *New York Times* of February 22 carried the announcement that Larry was elected president of the American Paper and Pulp Association, at their meeting the previous night at the Waldorf-Astoria Hotel.

George McCarten is located with Calco Chemical Company in Bound Brook, N.J., and has recently remarried. He states that he saw Doc Flynn at Christmastime. — We were fortunate to have Bill Bassett in town for this event; Bill is metallurgical development manager of the Anaconda Wire and Cable Company. — Nelly Bond is with the American Telephone and Telegraph Company, working on European cable messages. — Lester Wolfe was in New York City for the winter, residing at the Fifth Avenue Hotel.

It was interesting that everyone present was married and had from one to six children, with an over-all average of about three. After hearing Tim Shea tell about his golf scores in Los Angeles and other parts of the country during the past few months, we began to realize why he was so hot at the reunion last June in Boston. The subject of our 25-year reunion was discussed, and it was suggested that the Class consider giving the Institute a permanent gift at that time. Your Secretary would appreciate any suggestions that members of the Class may have on both the reunion and this gift.

Raymond C. Baldes has been made a professor at the Boston University School of Law. Ray H. Bartlett has moved from Waltham to West Newton, Mass.; Edward F. Deacon has left Chicago, Ill., and is now president of the Climax Engineering Company, 612 Southland Building, Dallas, Texas. Thomas J. Hughes has moved from Bexley, Ohio, to 2136

## 1919 Continued

South Geddes Street, Syracuse, N.Y. George A. Inglis lives at 51-09 Bell Boulevard, Bayside, Long Island, N.Y. Harry H. Mardoian resides at 455 Fountain Street, Hartford, Conn. Mason S. Noyes has moved from Cherrydale, Va., to 4819 24th Road North, Livingston Heights, Arlington, Va.; and Maurice H. Role, from Roxbury to 27 Abbot Street, Dorchester, Mass.

Your Secretary had a letter from L. A. Gillett, 5746 Marmion Lane, Cincinnati, Ohio. He is married and has a fourteen-year-old son. He travels all over the eastern part of the United States as director of the W.P.A. district composed of fifteen counties in southwestern Ohio, covering an area of 8,500 square miles and employing a peak of 45,000 workers. Gillett's hobby is anything connected with the operation of railroads, with steam preferred. He sees Charles Kennedy occasionally. — Roger T. Hall wrote from Washington, D.C., stating that he has been very much interested in reading *The Review* notes and congratulates your Secretary on the good work. Roger has been a resident of Washington for the last seventeen years. His business is building construction, and for the past three years he has been president of Sweetman and Hall, Inc., specializing in reinforced-concrete building construction. Roger states that there are several 1919 men around but that except for Fred Hewes he seldom runs into them.

Jack Fleckenstein wrote from Carson City, Mich., where he is vice-president in charge of sales of the Crystal Refining Company, which he organized in 1935. We were glad to hear that he has been doing fairly well. His home address is 419 Union Street, Ionia, Mich. — Charlie Farist wrote from West Cheshire, Conn., where he is secretary of the Ball and Socket Manufacturing Company, manufacturers of hose-supporter trimmings, thumbtacks, buttons, sheet-metal and wire specialties, and screw-machine products. He has a daughter ten years old.

Your Secretary talked to John Meader the middle of February, and I think Meader is to be congratulated on his excellent article in the February Review, entitled, "To Fit the Car to the Family. Is Conventional Design Sensible in the Light of Economic Trends and Functional Requirements?" The following story about Meader's experiences after graduation was carried on page 138 of that issue: "... Mr. Meader has served the automotive industry both at home and abroad, having spent some five years in Cuba and the Far East for one concern, and as many more working on foreign assembly-plant appropriations and budgets and making special studies of the British and German automobile markets for another. After a year with the Fokker Aircraft Corporation, during which he helped correct instability faults in the first F-32, then the largest airplane constructed, he joined the New York Trust Company where his general field is statistical and economic research, and his special preoccupation the forecasting of interest rates and business activity."

Your Secretary spent a very pleasant evening with Buzz deLima early in February. Buzz is now president of the Roger Smith Hotels and at the moment is running the Nacional Hotel in Havana, Cuba, the largest hotel outside the United States. Your Secretary believes that Buzz is probably very proficient at some of the latest steps, such as the tango, conga, and *rumba*; he already talks of other Cuban steps which will be starting in New York City late in the spring. — Your Secretary spent a pleasant evening with A. C. Carlton '17 and Nelly Bond during the convention of the American Institute of Mining and Metallurgical Engineers in New York, the week of February 12. — Your Secretary was in Houston, Texas, early in February and spent a very pleasant afternoon with Ernie Voss. Ernie is married, has two children — a girl three years old and a boy seven years old — and is pretty well sold on Texas, where he is chief engineer of the Humble Oil and Refining Company.

Earl P. Stevenson, President of Arthur D. Little, Inc., addressed the Boston Stock Exchange Institute on February 5 on the floor of the exchange on the subject of new products from the chemical industry. Stevenson joined the staff of Arthur D. Little as a research chemist in 1919. Later he became vice-president and in 1935 succeeded the founder of the business, the late Arthur D. Little '85, as president. He was instructor in chemistry at M.I.T. for two years and was associated with the chemical warfare service during the World War. — EUGENE R. SMOLEY, *Secretary*, 2 Fairmount Avenue, Hastings-on-Hudson, N.Y. GEORGE W. MCCREERY, *Assistant Secretary*, 275 Cypress Street, Newton Centre, Mass.

## 1921

Can you identify a mechanical engineer, now in his early forties, six feet three inches tall, who played the pipe organ at some church while studying at the Institute? No, your column has not developed into a quiz program nor is this question related to the date of this issue! Edward L. Moreland '07, Dean of Engineering at Technology, has requested a number of Class Secretaries to try to find the man who fits these specifications in order to answer an urgent appeal for help from the widow of an engineer with whom this man discussed a new development which is believed to be of importance. If you can suggest the name of anyone of any Class who approximates the above description, please write immediately to Dean Moreland.

Richard W. Smith, XII, is hereby most heartily thanked for sending a welcome letter bringing his history up to date. Dick will undoubtedly be remembered in that extra-pleasant section of the hereafter reserved for those who extend a helping hand to Class Secretaries. Dick says: "It seems to take a major change in my occupation for you to get a letter from me. On January 1, I resigned as geologist with the Georgia division of mines, mining, and geology to accept employment as mineral economist (geo-

logic) with the United States Bureau of Mines, at their southern experiment station at Tuscaloosa, Ala. To review what I have done since leaving the Institute: I was first assistant geologist on the Tennessee Geological Survey, working principally on the phosphate deposits of Tennessee. I left in 1925 to attend Cornell University, where I got my master's degree in June, 1926, and then went to the Georgia Geological Survey as assistant state geologist.

"My first work in Georgia was on the clay deposits, which resulted in the publication of two large reports, one on the sedimentary kaolins and the other on the shales and brick clays. On the death of the former state geologist in 1933, I was appointed to his place. In 1937 the state Geological Survey was made the division of mines, mining, and geology of the department of natural resources and I was appointed acting director of the division. In 1930 I married Miss Katharine Cox of Rome, Ga., and we have two children — Ann, nearly five years old, and Philip, who is nearly three.

"My work with the Bureau of Mines will be on an investigation of the clay deposits of the southeastern states. I am sharing an office with our old classmate, Jim Cudworth, XII, director of the school of mines of the University of Alabama and consulting mining engineer with the bureau.

"I like Tuscaloosa, and the work is very interesting, but I shall miss the very active Atlanta Alumni Association of the M.I.T., of which I was secretary several years and president for two years."

From the New York *Herald Tribune* of February 11: "Miss Elizabeth Cleveland Thornberry, daughter of Mrs. Francis Lambert Thornberry of this city and Mr. Tabor, N.J., and the late Mr. Thornberry, was married yesterday afternoon to Mr. Norman Frisbie Patton [IX-B], son of Mr. and Mrs. Guy Patton of this city, at the Fourth Presbyterian Church. Mr. Patton is Director of the Bureau of Information of the Anthracite Institute, 19 Rector Street, New York City. The couple will make their home here." Congratulations and best wishes from all of us, including Scripps Booth, who has generously offered to call a temporary truce in the oil vs. coal argument!

George A. Beeche, III, is now head over heels in politics, according to a note received from Charlie Locke '96 which says in part: "He was elected to the chamber of representatives in Chile two years ago and is now a big man with the government. He has developed a flair for flying, and most of his political campaign was carried out in his airplane. On one occasion he cracked up rather badly: He was making an exhibition flight and one wing dropped off, but he was fortunate enough to fall into the ocean very close to the shore and was saved with not more than a couple of fractures and the loss of some teeth." When not campaigning or barnstorming, George can be found at Compañía Salitrera Esperanza, Calle Agustinas 972, Oficina 538, Santiago de Chile, S.A.

*You will find on page I information on Alumni Day, June 3*



1921 Continued

William Rose, Jr., IV, played host to the M.I.T. Club of Northern New Jersey by inviting the group to hold the February smoker at the Christian Feigenspan P.O.N. brewery, Newark, N.J., of which Bill is vice-president and general manager; Alan R. Allen '23 is also an executive. A trip through this largest of all breweries, a hearty beefsteak dinner, and plenty of good P.O.N. beer were the order of a most enjoyable evening of fun. Besides Bill, other members of the Class in attendance were Dayton Brown, Max Burckett, Cac Clarke, Asher Cohen, Bill Emery, Sumner Hayward, and Fred Kowarsky. Brownie came over from Long Island to meet with the gang and took such a liking to P.O.N. that, as announced in the newspapers within the next few days, he arranged to move his whole company over to Newark Airport so as to be nearer the source of supply. Brownie is vice-president of the Brewster Aeronautical Corporation.

Manuel S. Vallarta, XIV, Professor of Physics on the Institute's Faculty, is credited with one of the major scientific discoveries of 1939. Under the astronomy section of a review of the outstanding technological developments of last year, the New York *Herald Tribune* said: "The existence of a general magnetic field on the sun was demonstrated by Dr. M. S. Vallarta of M.I.T. through cosmic ray studies." — In response to an appeal from the Alumni Athletic Fund, the Class has forwarded a check for \$25 to Ralph T. Jope '28, the Secretary-Treasurer.

The request of the Register of Former Students has brought in many current addresses, including Josiah M. Briggs, VI, Gamewell Company, 201 North Wells Street, Chicago, Ill.; Harry Butters, III, James Simpson and Company, 151 Milk Street, Boston; William E. Caisse, IV, 48-44 48th Street, Woodside, Long Island, N.Y.; Harold H. Cake, VI-A, 6502 Southeast 31st Street, Portland, Ore.; Lawrence D. Chellis, II, 44 Summer Street, Weymouth, Mass.; Eugene S. Clark, VII, Illinois State Division of Sanitary Engineering, Springfield, Ill.; John S. Cummings, VI, 1055 North 22d Street, Allentown, Pa.; Major Merle H. Davis, X, care of Chief of Ordnance, Munitions Building, Washington, D.C.; Andrew Deane, XV, Erwin, N.C.; Robert B. Frost, X, 608 Anderson Street, Greencastle, Ind.; Webster W. Frymoyer, II, 43 Granite Street, Foxboro, Mass.; George O. Hartman, I, Bethlehem Steel Company, Mariners Harbor, Staten Island, N.Y.; Frederick H. Hermann, VII, 608 Franklin Street, Melrose, Mass.; Arthur L. Jackson, XIII, 23 Tampa Avenue, West Asheville, N.C.; Francisco L. Lazo, I, Apartado Postal 10633, Mexico D.F., Mexico.

Also reporting changed mailing addresses are Leo Mann, V, Cumberland Chemical Company, 9 Federal Street, Providence, R.I.; Fred W. Marlow, I, 4135 Charlene Drive, Los Angeles, Calif.; Archie L. Mock, XIII, 8340 De Longpre Avenue, Los Angeles, Calif.; Kenneth A. Moores, XIV, K. A. Moores, Inc., 2735 1st Street South, Seattle, Wash.; Dr.

Oscar F. Neitzke, X, 26 Johnson Heights, Waterville, Me.; Aubrey J. Northrop, II, 540 Allen Street, Syracuse, N.Y.; Frederick F. Olson, III, 6 Rutledge Road, Belmont, Mass.; Ernest Pauli, XV, Foote Gear Works, 250 West 54th Street, New York, N.Y.; Edward M. Richardson, I, 3607 Russell Place, Alexandria, Va.; Bruce F. Rogers, X, 752 Forest Avenue, Rye, N.Y.; S. Eastman Root, II, 84 School Street, Concord, N.H.; John A. Scarlett, X, Barium Products, Ltd., Box 920, Modesto, Calif.; George Schnitzler, II, 10 Short Street, Brookline, Mass.; John E. Shaw, III, 3642 Yorkshire Road, Pasadena, Calif.; Edward D. Shea, VI, 94 Jersey Street, Marblehead, Mass.; Oscar B. Sias, I, 37 Bellevue Avenue, South Portland, Maine; Robert E. Travis, XIII, 206 West Hickory Street, Hinsdale, Ill.

Calendar: Alumni Day, June 3; our Tremendous Twentieth, June, 1941; news for your Secretaries, now! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, International Telephone Development Company, Inc., 137 Varick Street, New York, N.Y.

## 1922

With a large number of Technology Clubs scattered over this country and abroad, it is good to know that many of the Class have continued their active participation in Institute affairs by giving their time and influence to these Technology organizations. Abroad, Claus F. Thellefsen is secretary of the Technology Club of Norway; while in Zurich, Switzerland, Werner Schoop has been appointed by President Compton to act as one of our academic ambassadors, with the title of honorary secretary, for a five-year term which expires in 1943. The duties of Honorary Secretaries are to interview and assist prospective students, co-operate with the Placement Bureau, and, in many other ways, contribute to the general well-being of Technology.

In this country, 1922 has three Presidents of Tech Clubs: Kenneth M. Cunningham of the Technology Club of Rochester; Edwin A. Gruppe of the M.I.T. Club of Central New York, in Syracuse; and Harold O. Berry of the Worcester County Alumni Association of M.I.T. When Berry received the toga last November, there was a large delegation on hand at the Bancroft Hotel in Worcester. H. B. Richmond '14, President of the Alumni Association last year, was the principal speaker on this occasion, and O. B. Denison '11, official cheerleader of the Alumni, was elected vice-president. Not that the Worcester Club needs a cheerleader, because under Harold's leadership it is doing quite well, thank you. Others of our Class who were there were Robert H. Brown — still with Parks-Cramer Company in Fitchburg — and Webster K. Ramsey. Berry is chief engineer of the Florence Stove Company, Gardner, Mass. Our three American Club Secretaries are Philip M. Alden of Philadelphia, Clayton D. Grover in Newark, and F. Reed Dallye in Pittsburgh.

## THE TECHNOLOGY REVIEW

Apparently Dr. Compton relies heavily on the judgment of our Class, as 1922 has eight Honorary Secretaries in this country, widely scattered from Maine to the state of Washington. In Augusta is Willard B. Purinton (Purinton Brothers); in New York, C. George Dandrow (Johns-Manville); Duncan R. Linsley (First Boston Corporation), and Raymond C. Rundlett (Curtis Publishing Company); in Atlanta, William E. Huger (Courts and Company); in Chicago, Albert J. Brownning (United Wall Paper Factories); in Seattle, H. W. McCurdy (Puget Sound Bridge and Dredging Company); and in Bridgeport, Donald F. Carpenter (Remington Arms Company).

On January 20, it is reliably reported, Rupert S. Carven, Jr., and Dorothy Veronica Durant of Somerville, Mass., were married. With five hundred persons at the ceremony and one hundred and fifty at the reception, Grand Rapids ought to declare a holiday and vote an extra dividend. The procession of vans you saw on Beacon Street was headed for Bonair Circle, Waban, Mass., where the new menage is under way. Rupe is sales manager for Colonial Beacon Oil Company, and on the side it is understood in local badminton circles that he is pretty hot stuff on the court.

Professor Locke '96 passes on the information that Herman P. Plaza is still with the Chilean State Railways, where he has a very good position. — Word has filtered back from abroad that Evald Tomanek has been, and perhaps still is, senior health counselor in the provincial health office of Moravia, in the city of Brno, as well as lecturer in social hygiene at the medical school of Masaryk's University in the same city. In addition to the certificate of public health that he received from the Institute, he now has added two more degrees, those of M.D. and D.P.H.

Not long ago Warren Ferguson was in Cleveland and saw Ralph Geckler, whom he reports in good health and circumstances. — Can anyone supply the Secretary with the address of C. Winchester DeVito, who was last heard of in California in the vicinity of the movie studios? Is there any information about Stanley E. Cliff, late of Lexington and Winchester, Mass.? Just drop a card to the Secretary if you know anything about these two. — Jack Hennessy, the eminent civil engineer, after a decade of estate building (principally for others, he says) in the South and elsewhere, returned to Brookline, Mass., not so long ago, bringing with him a very charming wife from South Carolina. They are living at 62 Rangeley Road with their two small children in the house that Jack squared built. — Take a look at the February issue of *Architectural Forum* for a close-up of Ted Miller's new house in Belmont. This should be a clear tip not to sell Dewey and Almy short. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. C. YARDLEY CHITICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

## 1923

We're indebted to Jack for the following from a clipping about Ed Thimme: "Mr. and Mrs. Fred E. Hoof of Paterson, announced the engagement of their daughter Anita, to Edmund J. Thimme at a New Year's Day reception held at their home, 5 Linden Road. Miss Hoof attended Benedictine Academy, St. Elizabeth Academy at Convent Station, and was graduated from Georgian Court College, Lakewood. She is a member of the North Jersey Country Club, Sigma Delta Sorority, the National Federation of Catholic Alumnae and the Passaic Chapter of the Georgian Court Alumnae. At present Miss Hoof is with the American Telephone and Telegraph Company in the chief statistician's division. Mr. Thimme is a graduate of Paterson High School and the Massachusetts Institute of Technology. He is active in boys' work, being an honorary secretary of the M.I.T. and a member of the executive board of the Paterson Council, Boy Scouts of America. He is a member of the American Institute of Electrical Engineers, the New Jersey Society of Professional Engineers, the M.I.T. Club of Northern New Jersey, the Kiwanis Club, and the North Jersey Country Club. He is associated with the Public Service Electric and Gas Company. No date has been set for the wedding."

Jack heard indirectly that Oscar L. Perkins is still in Hartford with the Aetna Casualty and Surety Company. His twins are seven years old now. — Lem Tremaine told Jack that Squibby has another son in the family. His first boy is about twelve years old (that is F. P., Jr.), and on November 2 came Robert Newcomb Squibb. Squibby is located in Chicago. — A note from Professor Locke '96 mentions that Luis Buch is reported to have been working in Bolivia in charge of a tin mine, but it is not certain that he is still there.

The following is from a release dated August 17 from the Civil Aeronautics Authority, Washington: "Harlee Branch, acting chairman of the Civil Aeronautics Authority, today announced the appointment of Daniel C. Sayre, widely known aviation editor, as director of the authority's bureau of statistics and information. A native of Columbus, Ohio, Mr. Sayre has an extensive background of experience in both aviation and magazine work, covering a period of nearly fifteen years. In 1925 he organized at Boston one of the pioneer airport companies of New England. For six years he held the post of assistant professor of aeronautical engineering at the M.I.T. and for two years served as research pilot in its flying weather laboratory, which each morning made an ascent several miles in height to gather data on upper-air weather. He holds degrees of bachelor of science and master of science from that institution. Mr. Sayre has been associate editor of *Aviation Magazine* and aviation editor of the magazine *Newsweek* for the past two years and was, at one time, connected with Pan American Airways, Inc. In

1931, Mr. Sayre married Miss Rosamond Foster of Claremont, N.H. They have one daughter, Mary Sayre, aged seven."

The replies are just beginning to come in, in answer to Bob Shaw's letter describing the proposed 1923 garden in connection with the new swimming-pool building, but an announcement as to the result of the poll on this project will be possible next month. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JOHN M. KECK, *Assistant Secretary*, 441 Mount Prospect Avenue, Newark, N.J.

## 1924

We are delighted to know that Henry B. Kane has joined the administrative staff of the Institute, which has called Chick from his work with the Boston Edison Company to assume responsibility for fund-gathering activities at Technology. — Nish Cornish sent the Secretary a card inviting members of the Class to partake of the hospitality of a hotel which he operates with his brother-in-law. Nish may be addressed at San Francisco 605, Mexico D.F., Mexico. — A note to the Alumni Office from Tony Rosado, Jr., says that he is in France awaiting orders to return to his post with Compania Telefonica Nacional de Espana. He is still unmarried, and may be reached at 46 Avenue de Breteuil, Paris.

The New York Times reported recently the engagement of Miss Louise Bunce of Middletown, Conn., to Winthrop L. Warner. — Many members of the Class have indicated their intention of attending Alumni Day, June 3; plan to come. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

## 1925

Your Secretary is currently being deluged with offers for the use of various resort hotels for the reunion. This is only another indication of the nearness of that event. Do not fail to make your plans to attend.

From Jack Dunbar, now in Miami Beach, Fla., comes this letter: "I am afraid that somewhere along the line, a notice of my temporary change of address has been stretched to mean a permanent one. The 1925 notes in the February Review would indicate such to be the case. While it is true that at present I am a 'snowbird' in Florida, about the time the Elevated decides it is safe to lay up their snowplows I shall be back in Arlington. . . ."

Our sincere apologies for the mistake in giving Jack's winter address as permanent. The correct home address is 1 Oldham Road, Arlington, Mass.

In reply to a letter from the Secretary, Nelson Malone writes: "Reply to your welcome letter is tardy because I have been away quite a bit of late and in fact am leaving tomorrow (February 7) for a month in the South. I appreciate your remarks about my reportorial attainments, for at the moment I fear I must let you down because I have not seen a '25 man for a dog's age — an old dog at that. I am most hopeful that I shall be back to the reunion in June. . . ."

Chink Drew, says *Tires* for January, has been made general sales manager of A. Schrader's Son of Brooklyn, N.Y. The following résumé of his connections with that company is also given: "Drew has been with Schrader's Son since his graduation from M.I.T. in 1925. He worked first in the production department and was later made a salesman in the Detroit district, and in 1933 became special representative in the Middle West. In 1935 he was appointed Pacific Coast manager with headquarters in Los Angeles, which position he held until his recent appointment. Last year he served as president, Los Angeles group, Rubber Division, American Chemical Society. At school Drew was National Intercollegiate hammer throw champion in 1924. A deep-sea fishing enthusiast, he also enjoys a 'four-handicap' as a golfer."

Horace Tharp Mann, of whose appointment as professor of petroleum engineering at the Missouri School of Mines we told you in December, died on February 8 of a heart attack after a week's illness. Of his connection with M.I.T. since receiving his degree of Sc.D. in 1925, we also told you in that issue. Prior to that time, however, he had already had a long and busy career. After some work as metallurgist, chemist, and assayer with the United States Smelting Company, Canyon City, Colo., between 1900 and 1904, he matriculated at the Missouri School of Mines and in the succeeding six years received the degrees of B.S. and M.S. in mining engineering and E.M. (professional engineering degree). He went from instructor to associate professor in charge of the department of metallurgy and ore dressing at the Missouri School of Mines between 1908 and 1919. From then until 1923 he was professor of metallurgy in charge of the department of metallurgy and chemistry at the Montana School of Mines, resigning to come to M.I.T. for graduate study. He was a member of the American Institute of Mining and Metallurgical Engineers, Mining and Metallurgical Society of America, Montana Society of Engineers, Tau Beta Pi (national honorary fraternity), Pi Kappa Alpha (social fraternity), and the Masonic orders, having taken both the Scottish and York rites to become a 32d degree Mason and member of the Shrine. He is survived by his widow, Besse Caselman Mann, and one son, Horace Tharp Mann, Jr. — HOLLIS F. WARE, *General Secretary*, 3 Aquavia Road, Medford, Mass. F. LEROY FOSTER, *Assistant Secretary*, Room 6-202, M.I.T., Cambridge, Mass.

## 1926

The first marriage of the New Year occurred on January 28, when Thomas R. Montgomery of Woods Hole, Mass., was married to Miss Virginia Swift of Plymouth, Mass. The permanent address of the Montgomerys will be 23 Murray Street, New York City. Montgomery is with the Gulf and West Indies Company, Inc., a company which deals with sponges and chamois. — George Taylor, formerly commercial engineer for General Electric

*You will find on page I information on Alumni Day, June 3*



1926 Continued

Vapor Lamp Company in Hoboken, N.J., has been transferred to the Nela Park engineering department in Cleveland, where he will head industrial-lighting activities. Taylor is married and is the father of two daughters, one six and the other eleven. The new address is 1540 Middleton Road, Cleveland Heights. At Nela Park he will join another '26 man, Red Elmendorf.

Colin W. Reith, formerly chief petroleum engineer for the Bahrein Petroleum Company, has been advanced to producing manager of the company's operations at Bahrein Island in the Persian Gulf. — In *Riposte* for December appeared a very glowing article on Joe Levis, recounting his extraordinary career as a fencer and reporting his entry into professional ranks by becoming coach of the M.I.T. fencing team. Joe is having great success with the team; more than seventy students are reported actively fencing under his tutelage. — Arthur F. Johnson is with the Big Bell Mines, Ltd., Big Bell, West Australia. — Edward F. Kerns is with the Museum of Modern Art Film Laboratory in New York City. — Ken Lord has widened his activities, with headquarters in Greenville, S.C., by becoming general agent for a variety of companies, including his old employer, the Reliance Electric Company. Ken is now covering Dixie like the dew. — Phil Richardson continues to teach at Simmons College, where he is now professor in the department of biology. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

## 1930

Headliner this month is Gerry Morse, XVI, with the recent announcement of his engagement to Miss Martha Putnam Levis of Jamaica Plain, Mass. — Hal Levinton, VI, is working with the United States Department of the Interior at the Bonneville project in Oregon. — Ray Rolin, I, has come east from Denver to Providence, where he may be found at the office of the United States Engineers. — Fred Twarogowski, II, has advised your Secretary of the legal change of his name to Trescott.

From Dave Landen, VI-A, I received the following letter: "... Before coming to Maine in 1937, I was with the United States Geological Survey as topographic engineer in Virginia, Maryland, North Carolina, Massachusetts, and Vermont. Became familiar with aerial mapping while in the U.S.G.S. and was asked to take charge of mapping activities in Maine by the United States Department of Agriculture. We are now winding up this job, and I am going to Pennsylvania — more aerial mapping. Had the pleasure of meeting the summer surveying camp staff at Machias, Maine, where I gave a talk on aerial mapping methods last summer." Dave enclosed an interesting clipping describing the methods followed by his staff. In six months large sections of Maine were photographed from the air and maps drawn which would have required about ten years of ordinary surveying. — Another reminder of our ten-

year reunion, June 1 and 2, with Alumni Day following on June 3. — PARKER H. STARRATT, *General Secretary*, Bradley Park Drive, Hingham, Mass.

## 1934

The notes for this month might come under the heading "Q not Q," for, although their quality is of the highest, their quantity does not set any record. Stuart T. Martin deserves our congratulations, for he has just received a promotion to an assistant professorship in physics and mathematics at Clark University, Worcester, Mass. For the last three years he has been an instructor in the same subjects. Besides this work, Stuart has done considerable research for the Radio Corporation of America.

Herb McKeague is engaged to Miss Phyllis M. Forsyth, daughter of Mr. and Mrs. John Forsyth of West Roxbury, Mass. Herb is working for Westinghouse Electric and Manufacturing Company. — Mr. and Mrs. Daniel E. Hanlon of Mountain Lakes, N.J., have announced the engagement of their daughter, Monica Rose Hanlon, to Jerry B. Minter.

On January 18 a daughter was born to Mr. and Mrs. George Fowles at Allentown, Pa. She is Carol Ann and weighed seven pounds ten and a half ounces at birth. — Another girl, Frances Joan, was born to Mr. and Mrs. Chester A. Tudbury on January 2.

That's all, folks; for the next issue of The Review, how about sending in a few more letters so that we can have a "Q and Q" issue. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, Chile Copper Company, Chuquimata, Chile, S.A.

## 1935

John Tyler, who was with us the first two years, is engaged to Miss Frances Blackwood of Cambridge. Charlie Hunt, Jr., will wed Miss Muriel Morgan of Mount Vernon, N.Y. Art Anderson, who was a graduate student in our Class, is the proud father of a daughter; Art is now a research associate in the Mechanical Engineering Department at the Institute. John Meakin and Miss Dorothy Deane of Brighton, Mass., have announced their engagement; John is a sales engineer with the Foxboro Company. Charlie Debes, who migrated to Rockford, Ill., after graduation, married Phyllis Reinert on March 2; Charlie is employed in the experimental and research department of Woodward Governor Company.

Adam Altglass has left the G. and K. Corporation of Minneapolis and is now with the Frazee Potomac Laundry Company in Washington, D.C. Jim Casale has joined the American Rutile Corporation, Roseland, Va.; he had been around Boston for some time after returning from Korea. Gerry DeGelder has left the Royal Indemnity Company and has joined the Zurich Insurance Company in Chicago. Dick Hall is now "employed" by Hall Company Merchandising, Inc., in New York City; he was with Katadyn Process Corporation. Hugh McMath has been

promoted to a professorship in the department of architecture at the University of Texas. Dwight Merrill has become naval inspector of ordnance at the Bausch and Lomb Optical Company in Rochester, N.Y.; he was formerly with Evaporated Metal Films Corporation. After all these years, we find out that Ed Rees is with General Electric in Niles, Ohio; this is the first news we have had of Ed.

Again we have one of those coincidental pairs of address changes: Frank Sellw has left Hampton, Va., for Natick, Mass. Right on his heels, Frank Sherlock moved into Hampton. Perhaps Frank scared Frank away. Many of us have read recently reports about the Navy's new model basin in Washington. News now comes that Bob Sutherland of our Class has been assigned to the basin. Ralph Woolf has received his medical degree from the University of Rochester and is now an intern at the Strong Memorial Hospital, associated with the University of Rochester.

On February 14 the Classes of 1934, 1935, and 1936 again held a gathering in New York City, this time at the German-American Rathskeller. Our Class was represented by Ed Helwith, now with Long Island Lighting Company; Fred (Beckstein) Bensin, with C. W. Lauman, water supply contractor, and married; John Mooring, American Telephone and Telegraph Company; Otto Zwanzig, with Public Service of New Jersey; Hal Everett, with the Foxboro Company; Moose Kennedy, doing publicity for Union Carbide Company; Ian McFadyen, with General Electric; Jack Orchard, that father extraordinary and superlawyer, with Wood, Molloy and France of New York City; and your Secretary. At the meeting we picked up the news that Zay Curtis is now with Brewster Aeronautics Corporation in Long Island City. — ROBERT J. GRANBERG, *General Secretary*, Care of W. C. Voss, 9 Old Town Road, Wellesley Farms, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

## 1936

Saint Valentine's is indeed the proper season to be writing these lines, for Cupid made spectacular inroads this past year among the hitherto unbroken ranks of Course XVII bachelordom. It all began in June, when Dick Hickman lost his heart to a southern gal, Miss Delia Peet of Knoxville, Tenn., and was married in that city, as previously reported. John Viola, on November 17, exchanged vows with a young lady of Waterbury, Conn., whose name we have not learned. Next day, in Bound Brook, N.J., Miss Margaret E. Beal became the bride of Charlie Betts. Mrs. Betts, who is a graduate of Mount Holyoke, formerly made her home in southern New Jersey. November 27 marked the third ceremony of the month, when Miss Edith Lago of Waterbury, Conn., became Mrs. Angelo M. Tremaglio in Waterbury, with Dick Halloran and Bill Mullen present at the wedding. Finally, on the thirtieth, with-

1936 Continued

out a word to any of us, Sebbi Mazzotta led Miss Gertrude Dolores Pagano to the altar, in Middletown, Conn.

Charlie Betts has recently returned to Boston as a concrete designer for the Carilli Construction Company; whereas Viola and Tremaglio are located in York, Pa., remodeling the post office. John alone, among the bridegrooms, showed up at the annual course reunion at the Statler, held December 23, with Messrs. Halloran, Leventhal, Mullen, Sawyer, and Viola attending. Topics of the evening proved to be the dullness in the construction game due to high costs and a risky return on the capital invested; and the probabilities of the bachelors' preserving their unmarried status until the next reunion. — Saul Lukofsky very quickly answered a letter — a commendable procedure. He reports himself as single and in good health, having recently been transferred to the drafting department of the Carnegie-Illinois Steel Corporation, Irvin works, after spending fourteen months each in construction and maintenance work. The problems are somewhat complex but interesting, says Saul, and the men are pretty much on their own, collecting their own facts and making field measurements whenever necessary.

Art Carota is still with Cantera Construction Company in Delaware; Norman White — Katahdin to you — is working for his dad, as is Senator Schoettler, who sent a very attractive Christmas card this year just to let us know he was alive. Bob Leventhal has changed his business connections but is still doing store-front construction work. Mullen commutes to South Braintree, where he is working on an extension to the Armstrong plant, and Dick Halloran is still in the landscaping game. As for yours truly (R.E.S.), who is still working for E. B. Badger and Sons on various pipe problems in connection with the Houdry cracking process, there could easily be thirty hours in the day and still there would be plenty of things not done for lack of time. Between reading about oil refining, pipe stresses, and so on, attending an occasional show, and week-end ski trips to New Hampshire and Vermont, there is just about enough time left to eat and sleep.

Among items concerning members of other Courses, it is reported that Ed Thompson, VI-C, who settled at Kearny, N.J., with Western Electric after graduation, was married to Miss Betty Bellejeau of Fanwood, N.J., December 29. The Thompsons are now living in a Newark apartment where one of their proudest possessions is an extensive collection of musical recordings, from Bach to Duke Ellington. — Jim Stewart, II, one of Boston's busiest young men, has recently become engaged to Miss Winifred May Ratcliffe of Jamaica Plain.

*Course I.* It's a long time since we've had a letter from one of the civils, but a recent word from Stan Levitt probably has the answer. He says: "For a Corresponding Secretary, you certainly do not do much corresponding." Then he goes on to suggest that we issue another

of our course newsletters. Well, we're still waiting for answers to the plea for news made about two years ago. If a few more of the gang will send in letters, a newsletter will be forthcoming soon. Stan repeats the announcement of his marriage last October 17 to the former Miss Hilda Janet Simmons of Greenville, Miss. Stan also reviews his past three and a half years in the engineering field: nine months with the Federal government, one year and nine months with the state of Louisiana, and one year in private employment. Now he plans to re-enter the employ of the Federal government in the second New Orleans Engineer District of the War Department, as a junior engineer. He took a Civil Service exam last May and managed to get an 83.2 per cent in his first try! He hopes the new job will take him away from detail drafting work for the first time and put him exclusively on design and administrative work. — George Ryan has at last been located in the wilds (?) of Brazil with the São Paulo Tramway, Light, and Power Company.

*Course XIII.* Keeping his New Year's resolution, Art Wells wrote us on February 17: "Since my last writing, there have been several additions to the roster of the Course. Mr. and Mrs. Philip Briggs announced the arrival of a son, Philip G., Jr.; Mr. and Mrs. Alan Hardman became the parents of a daughter, Judith; and Mr. and Mrs. Milton Brooks became the parents of a future M.I.T. varsity stroke. It was a real pleasure to be entertained in the home of Mr. and Mrs. James Henderson. On December 27, Jim was married to Miss Ruth Miles at the Miles's home in Washington, D.C. Mrs. Henderson is a graduate of the University of Maryland and was connected with the Johns Hopkins Hospital in Baltimore. Jim is in the estimating department of Maryland Drydock Company, and the newlyweds are living in Baltimore. Carl Engstrom is now working on ship design in the engineering department of George G. Sharp, naval architect, at 30 Church Street, New York City, and he and Mrs. Engstrom are living on Staten Island. Alwyn Gray has also come to New York and is now working in the hull technical department of Gibbs and Cox. Al was living in Montclair, N.J. He said that he wanted to be on the Chester, Pa., side of New York. He showed me her picture, and I don't blame him a bit.

"Frank Mather, after making everyone very jealous by crowding in a lot of good coastwise cruising last summer, joined the Course XIII staff at M.I.T. and is an instructor in naval architecture. Our company (Seas Shipping Company) is having new ships built by the Bethlehem Steel Company, and from the Bethlehem representatives who visit us in New York I hear of the good work of Art Mayo, Bill Budd, and Bernard Birdsall, who are doing technical work at Bethlehem's Fore River yard. I got a real kick the other day out of seeing the initials B.B. on one of the drawings for the new ships. Jack Stapler is now settled in New York City and is connected with the Eagle Picher Sales Company in their marine sales de-

partment. Jack has been more settled than he has liked the last few weeks since breaking a bone in his foot during a skiing week end. Alden Anderson is now in New York City, having joined the traffic department of the United Fruit Company. A few weeks ago I visited the new United States Lines vessel, *America*, at Newport News and spent the evening with Warren Sherburne. He and Ed Rowe, together with two other Newport News naval architects, have a roomy house in Hampton, Va., which goes under the name of the Eight Ball Club. . . . Although I didn't have a chance to see the others of the Course who are at Newport News, Sherburne reports that all is well with the Graham and Donnan families." — Art also informs me that I failed to announce the marriage of Clarence Horton to Miss Louise Carolyn Gardner, formerly of Coraopolis Heights, Pa., on May 24. Another member of our Class with the Bethlehem Steel Company at the Fore River yard is Gene Eberhard, VII.

Word has arrived of the wedding of Jack Gardner, XV, and the former Miss Elizabeth Ann Butterworth of Chestnut Hill, Pa., on January 20 at four o'clock in the afternoon. The corps of ushers sounds like a 1936 reunion and included Tom Johnson, Ed Rust, Marvine Gorham, Jim Grove, and Francis Danforth. — Another recent wedding was that of Noran Kersta, XVIII, and Miss Ruth C. Tully. Kersta is co-ordinating television activities for the National Broadcasting Company at Radio City. — Bill Garth, XV, is back in Boston, still with Manufacturers Mutual. — Scott Redfield, II, is at the Logan Field terminal of American Airlines in Baltimore. — Charlie Price is with the wire rope division of Jones and Laughlin Steel Corporation in Pittsburgh. — And Tony Hittl is still at the laboratory of the Linde Air Products Company in Tonawanda, N.Y., except when he is at the address below anxiously awaiting news about the members of the Class! — ANTON E. HITTL, *General Secretary*, 109 Shepard Avenue, Kenmore, N.Y. ROBERT E. SAWYER, *Assistant Secretary*, 55 Robinwood Avenue, Jamaica Plain, Mass.

## 1937

Well fellows, Frances Blackwood — one of our esteemed coeds — and John E. Tyler '35 have announced their engagement. Frances has received her B.S. and is now working on her Mrs. — Philip Bliss, who is with the Metropolitan District Water Supply Commission, was married sometime in January to the former Miss Ruth Alden of Framingham, Mass. Good luck, Phil and Ruth! John K. Jacobs and Miss Elizabeth Kinsman of New York were married on January 5, and I had to hear of it through a Chicago outlet — with New York but thirty-five miles away! John is with the Industrial Rayon Corporation in Cleveland, Ohio, so I imagine they are living there.

Dick Young has finally broken down and written: "The Class holds true to form in that its men move over the face of

*You will find on page I information on Alumni Day, June 3*



1937 Continued

this country with the speed and frequency of the latest 'Confucius.' Bill McCune, Jr., is just hopeless, but then his success may rise from our despair. At one time I was used to thinking of Bill in Cleveland; the change to Erie, Pa., was not too unprecedented; moving on to New York City lent an air of cosmopolitanism; but Bill, how on earth have you wound up back in Boston? The McCune Express has had about enough time to refuel — watch out, West Coast. However, one man cannot form a class average, there are others who have the wanderlust: Art Hunt has torn up this section of the country, tasting pay rolls of varying vintage, with a momentary rest right here in New Haven. Art has now developed a business of his own — manufacturing and selling the Smooth-cut can opener, and it turned out to be a good piece of work on Art's part. . . . Phil Dreissigacker, Jr., harbored in the port of Naugatuck Valley, Conn., and then left us for windy Buffalo. Phil is now in one of those jobs where excellent work may turn out to be so heartbreaking. Our company, Farrel-Birmingham, makes reduction drives for navy ships, and I know that the hours of toil have been expended in what may, though we sincerely hope not, soon become a means of destruction. . . . Johnny Gander, another of us at Farrel's, trekked off to Buffalo but crept back into the folds of our sales department. Johnny has been doing marvelously, yet I can't seem to draw him into the nuptial circle. . . . Phil Peters, brother in Sigma Nu United (plug), will soon take out unlimited traveling rights on our railroads because he has been promoting John Hancock group annuities in New England, the South, and not the least of all, has succeeded in stopping off in his old stamping grounds, Chicago. (As I write this, a letter comes from Phil saying that on the thirteenth of February he is off again to St. Louis, on then to Oklahoma City, visiting Abilene, Texas, and rounding off with the long trip back to Wellesley — Amen.) The breezes stirred up by the transcontinental traveling of these 'unpredictables' will leave the rest of us prostrate in the wake. . . .

"Gil Winslow who is connected with Lumberman's Mutual Casualty Company rests a married man in Bridgeport. . . . Gil quoted fire insurance to me, and on the supposition that his apartment and mine were similar risks I agreed to go ahead with the policy. How secure it is to discover that you live in a firetrap even though your apartment seems identical with one which is comparatively non-combustible! In New York one's chances of meeting old friends tops all other places. Found Bob Ferguson, our crew captain, who can now disregard the old training rules, having a marvelous time letting his hair down at the Colony House Capers. . . ."

George Megerian, about whom many of us have wondered, has finally turned up within twenty miles of Boston, in

Lynn — 20 Harwood Street, to be exact — and on February 6 wrote a very fine letter: "Although letter-writing has become one of my pet aversions, I just couldn't stand by after reading Al Woll's note in the February issue of *The Review*. When I saw myself referred to as 'when last heard from,' I decided to let people know I was still alive! I have been with General Electric at the River works here in Lynn since the summer of 1937. My work is classified as manufacturing and methods and I'm working on special assignments for the superintendent of the gear department. Other '37 men who are in Lynn with General Electric are Leonard Seder, X, in the laboratory; Gordon Wilkes, Jr., III, in the laboratory also; John Nugent, II, in the turbine department; Melvin Prohl, II-A, turbine department; and Walter Kozak, XIV, lab. Incidentally, Walter has become engaged to one of Lynn's many charming girls — Phyllis May Oberlander. . . . My very good friend John Priftakis, X, became engaged some months ago to Carol Copoulos, also of Lynn.

"Leo Moore is still working for Raytheon Production Corporation of Newton, Mass., but he might as well be in East Burlap, Siam, because I see him only once in a dog's age. When he writes, however, he tells me that he's happy. . . . Last summer I visited our own Paul A. Vogel, XV<sub>2</sub> (remember the password of Course XV, 'Vogel says'?), in New York where he is employed by Standard Statistics Company, Inc., forecasting the action of the stock market. He informed me that Bill Healey, XV, had left the Hearst newspaper outfit to join the General Chemical Company boys in New York.

"On New Year's Eve I bumped into Puzant Bakarian, XIV — I assure you I wasn't under the table — somewhere in Harvard Square. He is still connected with Dow Chemical, but at present he is studying for his doctor's degree at Yale. He obtained his master's at the University of Michigan. Leo Dantona, IX-B, is now a married man and is selling steel for some company with offices in Cambridge. André Laus, V — 'Lawse' not 'Louse' — is with the Monsanto Chemical Company in Everett, Mass."

On February 1 the M.I.T. Club of Northern New Jersey conducted a steak party and a tour at the Christian Feigenspan Brewing Company in Newark. We all had a most wonderful time and are looking forward to another chance to visit the plant and, what is more important, to sample the product. This was the famous P.O.N., Pride of Newark, and it certainly lived up to its name that night. There were about a hundred and fifty of us there from all Classes and six or seven from '37. I didn't jot down any names, but those I remember were Rupert Lewis, Norm Birch, who came down from Suffern, N.Y., Roy Smith, Jack Booton, and George Ewald. The Club is having its annual banquet the first part of May, so I

hope to see many of you at that time. — WINTHROP A. JOHNS, *General Secretary*, 245 Hale Street, New Brunswick, N.J.

## 1939

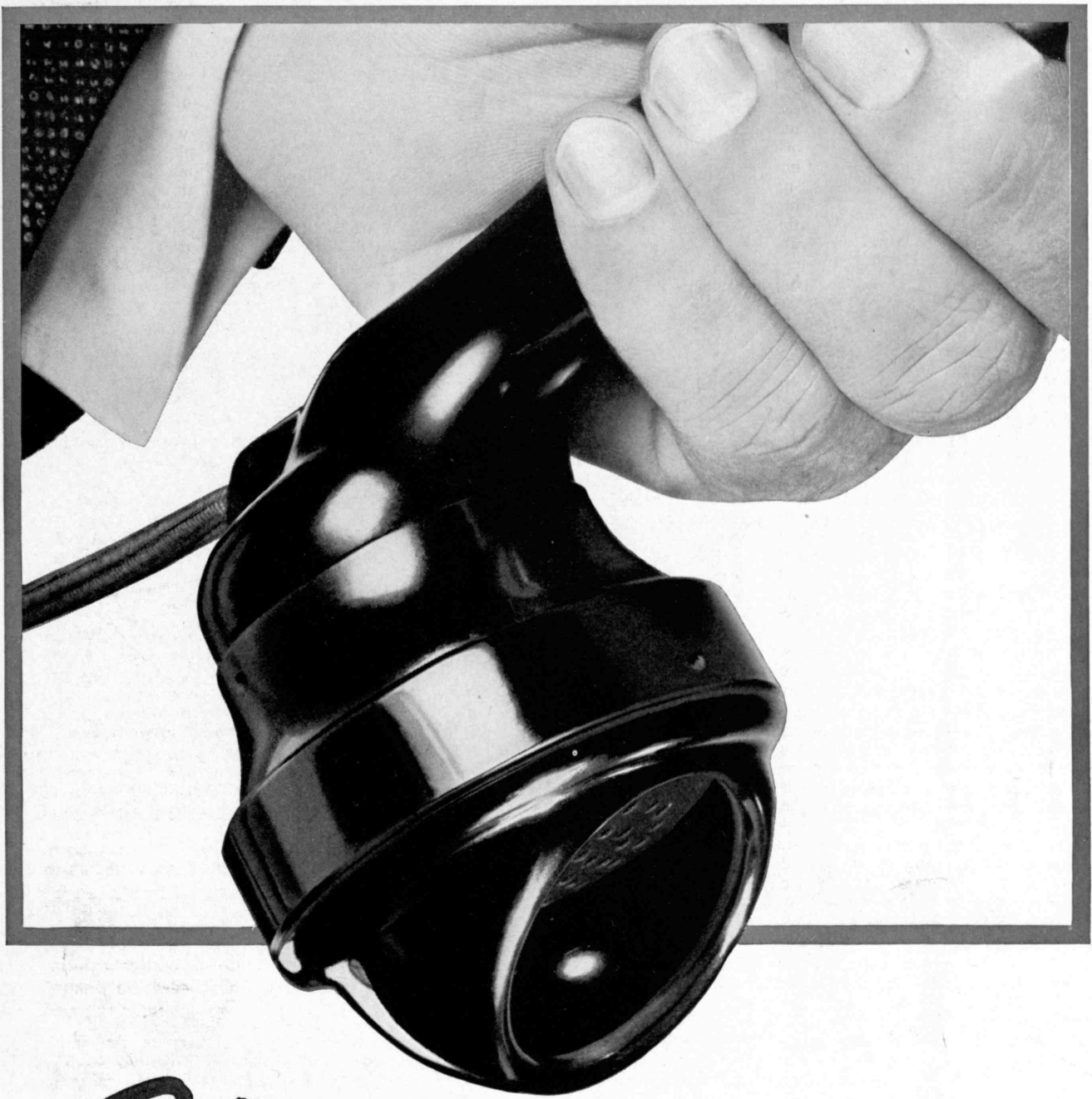
From Course X, we discover that George Beesley of Alpha Chi Sigma and Musical Clubs fame, has recently become engaged to Miss Eleanor Cook of East Greenwich, R.I. — Oz Stewart, II, writes "While on a plant visit . . . at the Seymour Manufacturing Company, I was surprised to see Ralph Tucker. He is located in their engineering department, having worked there for the previous two summers, and has been with them now since August. . . . At a regular meeting of the New Haven County Technology Club, held at the Chase Country Club recently, not another '39 man did I see. Where do you suppose all of these birds are hiding? My ex-thesis partner, Sungu Soyak, is proceeding merrily along at the Institute, heading for his master's. He is now beginning to get a little impatient about heading for home where he has a job waiting. Consequently, he plans to leave in June for Ankara, Turkey. From a roundabout source, I hear that Al Chestnut, III, is located at Box 981, Morenci, Ariz."

The Graduate House seems to have been taken over quite thoroughly by '39; noted with interest in the latest soiree to Boston was the return of several of the Course X Practice School group: Carl Lenk, George Mitchell, Brownie Parker, Nick Carr, Johnny Vyverberg, and many others. Also encountered in the halls were Morrie Nicholson, Doc Wingard, Dave Frankel, Bill Pulver, Perry Crawford, and Bill Merritt.

And, speaking of the G.A., the place to see, Ab Towers seems to have been taken into the partnership, while George Dadakis seems to have lost his familiar touch. Also in the Big City, acting roughly in the capacity of an official welcoming committee, we note with interest the very swank apartment shared by Durb Woolford and Leigh Hall, plus Doug Esperson and Jay AuWetter '38.

Riley Anthony, II, reports that he is with the Goodyear Tire and Rubber Company in Jackson, Mich., as a member of their production training squadron: "The squadron, or squad, is just a glorified name for the fellows who are going through a sort of training course. We work out in the plant with the rest of the rubberworkers, perform the various operations, get our clothes, faces, and hands dirty, work out every muscle in our body, and . . . have a wonderful time."

And, in order that this column may continue to appear, we close with the standing request for information concerning promotions, achievements, occupations, marriages, transfers, births, engagements — bluntly, boys, news. — STUART PAIGE, *General Secretary*, Box 207, Greenwich, Conn. MORRIS E. NICHOLSON, *Assistant Secretary*, M.I.T. Graduate House, Cambridge, Mass.



# *Big* enough for the job

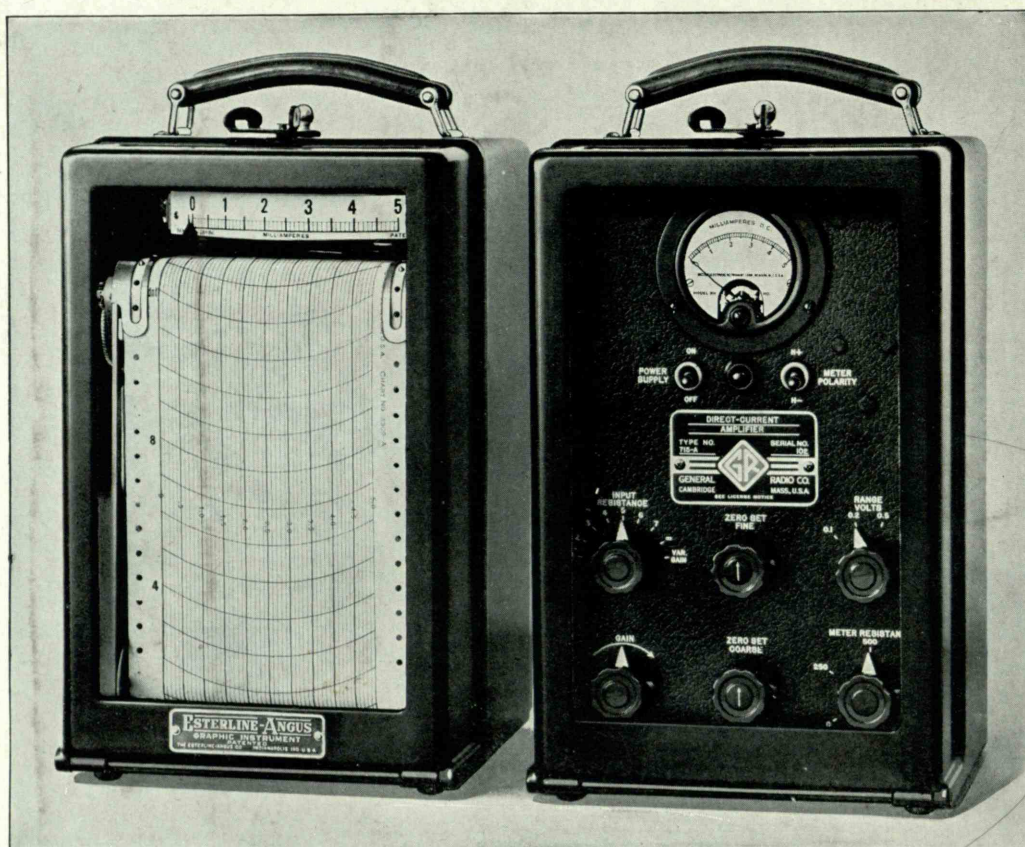
We live in a big country and it takes a big telephone company to give good service to millions of people. The Bell System is doing its part in providing for the nation's telephone needs, whatever they may be.

But the Bell System aims to be big in more ways than mere size. It aims to be big in the conduct of its business, in its relations with employees and its plans for the future. All of this helps to give the nation quick, dependable, courteous telephone service at low cost.

**BELL TELEPHONE SYSTEM**







## FOR CONTINUOUS RECORDING OF SMALL VOLTAGES AND CURRENTS

**T**HE General Radio Type 715-A Amplifier, with an appropriate recorder, constitutes a calibrated recording voltmeter. With suitable input resistances, the combination is also a recording milliammeter or microammeter.

Its industrial applications are many and include such as continuous recording of light intensity, frequency, sound and radio meteorograph observations.

The amplifier in addition can be used in automatic control circuits where the amplifier output operates relays to control the device which drives the amplifier.

This amplifier has high gain, operates from an a-c power line, is very simple to use, requires practically no attention and can be run for long periods for continuous recording, is exceptionally stable with freedom

from effects of line voltage variations and has a wide range of built-in input voltage and resistance combinations.

Full-scale output of the amplifier has been made 5 milliamperes to operate a 5-milliampere Esterline-Angus Graphic Recorder. This full-scale output can be obtained on calibrated ranges from input voltages of 0.1, 0.2, 0.5 and 1.0 volt. Higher voltages can be recorded on an uncalibrated range up to 50 volts or more.

The input resistance can be varied between 100 ohms and 10 megohms in powers of 10, by means of a panel switch. In addition, an input potentiometer is provided for a variable gain at an input resistance of 150,000 ohms.

**PRICES: TYPE 715-AE AMPLIFIER (Cast Metal Case, illustrated) \$250.00**

**TYPE 715-AM AMPLIFIER (Walnut Cabinet) \$225.00**

● *Write for Bulletin 562 for Complete Information*

**GENERAL RADIO COMPANY**  
**CAMBRIDGE, MASSACHUSETTS**  
 Branches in New York and Los Angeles